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PUBLIC LIGHTING BY GAS & ELECTRICITY

By W. J. Dibdin, F.I.C., F.C.S.,
Late Chemist and Superintending Gas Examiner to the Metropolitan Board of Works and the London County Council.

(*Continued from page 561.*)

CHAPTER XV.—ELECTRO-MOTORS.

The different types of electric generators and the character of the currents they generate having now been described, we have still to consider how the power expended in the generation of the current by forcibly revolving the armature of the generator may be regained at some distant place, by conducting the current thence along copper wires and causing it to flow through a motor, whereby its armature is set in motion with almost the same force as that applied to the armature of the generator to produce the current, the loss of power being due mainly to the resistance of the conductors opposing the flow of the current, but also to several other causes, such as the friction of the armature spindles on their bearings, &c. Continuous-current motors are constructed on exactly the same lines as generators.

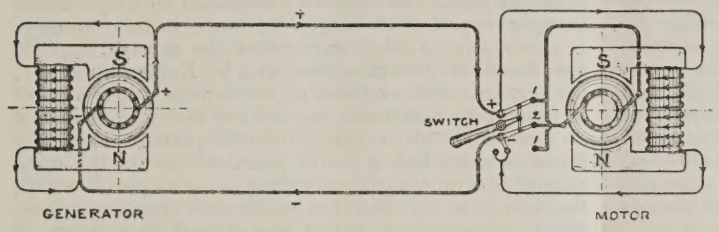

Fig. 23.

In a generator the coils of the armature cut through the lines of force in a magnetic field, causing magnetic lines of force to travel round the coils in opposition to those of the magnetic field, and a current of electricity to flow through them.

In a motor a current of electricity magnetises the field magnets, thus producing a magnetic field in which the armature is suspended, and a current of electricity at the same time flows through the coils of the armature causing magnetic lines of force to travel round them, which, by setting themselves in opposition to those of the magnetic field, impart rotation to the armature.

Fig. 23 shows the manner in which the current from the generator is made to flow through the motor by connecting the two brushes of the former with those of the latter.

In the motor as well as in the generator a portion of the current flows through the coils of the field magnets, while the rest flows through those of the armature.

Since by passing a current of electricity through a conductor magnetic lines of force are made to circle round it in either direction, according to which end the current is made to enter the conductor, it is obvious that if a conductor is suspended in a constant magnetic field and a current be sent through it, entering first at one end, then at the other, the lines of force, by circling round the conductor, first in one direction, then in another, will cause it to move in opposite directions. By this means the armature of a motor can be made to rotate in either direction and reversed at will, the manner in which this is effected being shown in the diagram.

By means of a double-pole switch connected with the positive and negative brushes of the generator, the brushes of the motor can be differently connected with those of the generator, so that either becomes positive or negative, and the current is thereby made to flow through the coils of the armature in either direction.

The current flowing through the coils of the field magnets may not be reversed, however, as the poles must always remain constant.

Single-phase alternating-current motors are also constructed on exactly the same lines as the generator; that is, the field magnets are excited separately by a continuous current flowing through their coils, while the armature is supplied with alternating current from the generator. (See Fig. 24.)

It is essential in these machines that the motor should run at exactly the same speed as the generator if both machines have an equal number of poles, and faster or slower if the motor has fewer or more poles than the generator, and in proportion to the number of poles in both machines. The poles of the field magnets remain constant, whereas the current in the coils of the armature is constantly changing.

At a certain moment one set of coils is opposite the N poles, and the other set opposite the S poles, with the current flowing through them in opposite directions, so that they both tend to impart rotation to the armature in one direction only.

Next instant the current in the coils is reversed, and in order that the rotation of the armature may continue in the same direction the coils must have traversed the space which divides a N pole from a S Pole, so that those coils which were fomerly opposite the N poles are now opposite the S poles, and those coils which were opposite the S poles are now opposite the N poles. That is to say, a coil being opposite a N pole with the current flowing momentarily through it towards the onlooker tends to impart a clockwise rotation to the armature. Next instant the current flows away from the onlooker, and if the coil be still opposite a N pole it will drive the armature back again, or in an opposite direction. As the current changes, therefore, the coil must have travelled as far as the neighbouring S pole,

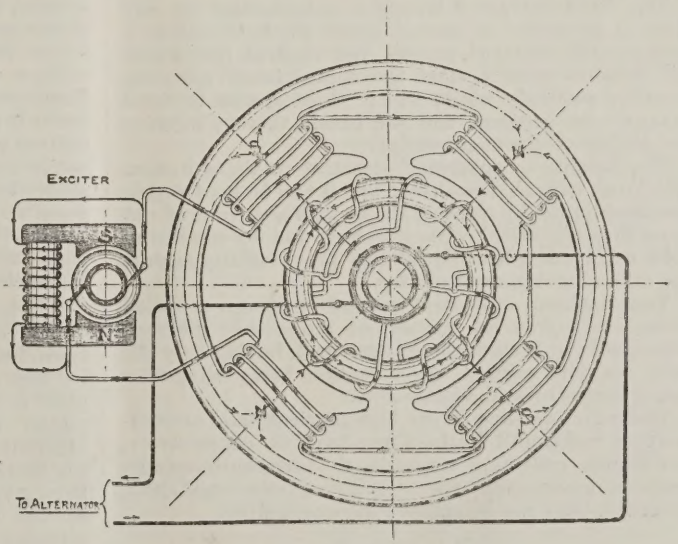

Fig. 24

so that the armature may continue rotating in the same direction, otherwise it will simply oscillate backwards and forwards.

In order that the motor may work, the armature must traverse the space dividing a N from S pole with the same frequency as the current changes from positive

to negative. To start the motor, the armature must be first revolved by hand, or by any other means, until the necessary speed is attained, when it will continue revolving as long as it is supplied with current, but it is liable to stop if a heavy load is suddenly put on.

In the case of small motors a portion of the alternating current may be converted into a pulsating continuous current by means of a commutator on the armature spindle, with which the magnets can be sufficiently excited.

The larger motors are usually built with a small continuous-current generator on the armature spindle for exciting the field magnet. To start these motors the small generator may be made to work as a motor by supplying it with continuous current from an accumulator until the requisite speed is imparted to the armature, when the accumulator may be switched off, and the motor then generates its own continuous current for exciting the field magnets, with which, too, the accumulator may be re-charged. Two and three-phase alternating-current motors may also be worked on this principle, and they have the advantage over single-phase motors in being self-starting, at least when unloaded.

In recent years single and polyphase alternating-current motors have been devised and constructed which work, although not well, on the same principle as continuous-current motors; that is to say, the alternating current flows through the coils of the field magnets, and magnetises them at the same time as through the coils of the armature, the use of a commutator being thus, of course, necessary.

The cores of the field magnets must be specially constructed, having alternate layers of very thin sheets of special soft iron and thin insulating material, so as to obviate as much as possible the loss of power that magnetising them alternately in opposite directions entails; for electro-magnets with cores of very soft iron retain only a very small portion of their magnetism, or none at all, after the current ceases to flow through their coils, whereas those having steel cores retain a considerable portion of their magnetism.

These motors are self-starting under full load, and they can be run at any speed, independently of that at which the generator runs.

The disadvantage of having a commutator on any class of generator or motor lies in the fact that as a commutator segment crosses the neutral line where the brushes press against the commutator, opposing currents suddenly meet, which cause sparks to form between the segment and the brush, thereby injuring the surface of the commutator.

The liability to sparking is greatest on those motors which run in both directions; but it can be kept within practical limits by working them with a current of not more than about 500 volts pressure, and by the use of thick carbon brushes adjusted to press radially against the surface of the commutator.

The modern alternating-current motors, so-called *induction motors* are worked on an entirely different principle from those hitherto described, having only the field magnets excited, the armature being altogether disconnected from the generator.

These motors have a very high efficiency and are self-starting under full load. They have no commutator, but simple collecting rings on the armature spindle become necessary if the speed requires regulating, otherwise they can be entirely dispensed with.

(To be continued.)

Mr. W. W. E. Fletcher, M.B., Inspector of the Local Government Board, recently attended at the Ormskirk Rural District Council offices, to conduct an inquiry as to extra borrowing powers for the enlargement of the infectious hospital.

SEWAGE DISPOSAL IN CALCUTTA.

By A. E. Silk,

Member of the Institute of Civil Engineers, Member of the Sanitary Institute, Sanitary Engineer, Bengal.

CHAPTER I.—Introductory.

In the author's pamphlet, "Recent Methods of Sewage Disposal in England," published two years ago, after he had had an opportunity of studying the all-important subject of sewage disposal in the country where it had advanced with such strides towards success within recent years, the lines were indicated on which it was thought experiments might be made in this country. It was shown in what particulars the sewage disposal question in India differs from that in England, namely, the concentrated condition of the sewage and its want of freshness; and it was pointed out that there must be no mere laboratory experiments with perhaps artificially made sewage, but a really practical one in the open ground of a municipality, dealing as far as possible with the sewage as it is found in public and private latrines. The Government of Bengal was pleased to approve of these suggestions, and instructions were issued to make the necessary designs, which were duly sanctioned and carried out. Fortunately at that time a new latrine for the native warders was required in the Presidency Gaol, and it was in the garden of the gaol that what is believed to be the first systematic experiment of the disposal o sewage by Nature's methods was carried out. In 189[illegible] a rough experiment had been made in the Garden Reach Municipality, but it was not a success for the reasons that will be given later on; an experiment was also made in Quetta in 1898 by Major Melville, R.A.M.C.,* but it was only continued for three months and no chemical analyses were made; it is understood, too, that a trial was also given to the biological system of sewage purification for the same period in 1899 in Simla, with results which satisfied the Local Authorities. Reasons were stated in the pamphlet referred to above, which led the author to think that the only practicable system for India was that known as the Septic Tank or Exeter system, and it was on these lines that the experiment was conducted; this was also the system, it is believed, that was adopted in the experiments referred to above. In India the sewage that has to be dealt with consists of solid fæces, urine, and sullage water — that is, the water used in cooking. There are practically no manufacturing wastes, and bath water is reduced to a minimum, as the majority of the natives of this country prefer to bathe in tanks or rivers out in the open. In the majority of cases the sewage is nearly twenty-four hours old before it reaches the disposal works, and on this question of the age of the sewage it will be instructive to quote the remarks made on page 434 of the Report of the State Board of Health of Massachusetts for 1898:—

"It is evident that, when this mixture of filth and organic matters of all kinds, with the waste water of a town, has just occurred, and little time has been given for mechanical, chemical, and bacterial actions to take place in the sewers, we have a liquid containing organic matter quite differently constituted—that is, of a different mechanical and chemical composition—from the same matter in the sewage when opportunity has been given for these various actions to take place. The sewage at first contains generally free oxygen and nitrogen in the form of nitrates and nitrites, and the proportion of organic matters in suspension is comparatively large. Such a liquid we call *fresh sewage*.

"As this fresh sewage flows along the sewers, mechanical, chemical, and bacterial forces act upon it, and the composition of its organic constituents under-

* *Vide* Report of the Sanitary Commissioner with the Government of India for 1898, page 277.

goes a distinct change. This change is practically the breaking up of the organic matter into simpler forms, and is the initial step in the process by which the organic matter is finally changed to inorganic matter. The change carried on in fresh sewage containing free oxygen is as follows:—The carbon, under bacterial influences in the presence of free oxygen, is oxidised, the nitrogen and hydrogen unite to form ammonia, and this unites with the carbon dioxide to form ammonium carbonate. Thus, until the dissolved oxygen is exhausted, the free ammonia increases, while the crude organic matter decreases. Sewage when its free oxygen has just become exhausted and its free ammonia increased to the maximum possible by the exhaustion of its oxygen, we designate as *stale sewage*.

"Sewage containing free oxygen, and for this reason comparatively free from putrefying actions, has not a particularly offensive odour, and the same can be said, though in a less degree, of stale sewage. When the oxygen is exhausted, bacterial life continues active, and chemical changes go on and continue the breaking up of the organic matter into simpler forms. But as oxygen is not present, the action by which the organic matter is still further changed is a putrefying one, and the sewage becomes very ill-smelling on account of the generation and escape of hydrogen compounds of carbon, sulphur, and phosphorus. Nitrogen is also set free in this putrefying process. The result of all these changes is to decrease the amount of carbonaceous and nitrogenous matter in the sewage. Sewage when in this state is now known, since the results of certain English experiments have been published, as *septic sewage*—not a very appropriate term, but one which we shall probably have to accept on account of its general use at the present time. This action, resulting in the change of stale sewage into septic sewage, can probably, if sufficient time is given, be continued until nearly all the organic matter in suspension is changed into soluble forms."

In most towns, therefore, it is *septic sewage* that has to be dealt with, but in the experiment, which is about to be described, the sewage must be classed as *fresh sewage*; for, as will be seen, it was delivered directly into the septic tank as soon as produced.

One of the objects of the experiment was to ascertain whether it would be possible to carry out the satisfactory disposal of sewage in the crowded quarters of a town, and thus avoid the nuisance and expense of its carriage to trenching grounds. Such sewage would in all probability consist of a large quantity of fresh sewage from the public latrine in or near the septic tank and a mass of septic sewage from the neighbouring private latrines. It was therefore originally intended, as soon as the septic tank and filters had been brought into thorough working order, to deal not only with the fresh sewage produced in the latrine, but also the septic sewage from Fort William. Considering, however, the site of the experiment—a few yards only from a public road, and a few hundred yards only to the north of the general hospital—it was thought undesirable to carry out this part of the experiment by reason of the nuisance that might possibly arise from the presence of a number of night-soil carts waiting to discharge their contents into the septic tank. It is very doubtful, however, whether the introduction of sewage, which had already reached the putrefactive or septic stage, into a tank containing similar sewage would have any real effect on the satisfactory working of the whole system.

CHAPTER II.—Structural Details.

It will have been understood that the supply of sewage for the experiment was derived from a latrine used by the native warders of the Presidency Gaol, and it was the size of this latrine that practically decided the area occupied by the septic tank. The superintendent of the gaol decided that a ten-seated latrine was required, and this was provided for in two rows of five seats each, separated from each other by a space of 3ft. in which the flushing valve for each seat was fixed, and having passages 3ft. wide in front. Each seat consisted of an ordinary closet pan at floor level, but fitted with Donaldson's patent automatic foot rests, by which the weight of the user is utilised in working the valves of the small flushing vessels in the valve chamber. Each flushing vessel was designed to contain exactly three gallons, the quantity now acknowledged to give the most effective flush; and the water was obtained from overhead tanks supplied in their turn from the Calcutta Corporation's filtered-water mains. Each pan discharged into a 6in. drain running underneath the valve chamber between the two rows of seats, and the sewage from the drain was discharged into the brick masonry tank on the top of which the latrine was constructed. In order that the sewage might be dropped into the tank with as little surface disturbance as possible, the end of the 6in. drain was formed of a vertical iron pipe with its mouth 2ft. 6in. below the normal level of the liquid in the tank; this arrangement also had the additional advantage of preventing any gases from the septic tank finding their way into the latrine and perhaps forcing the traps. The 6in. drain was ventilated at its summit and anti-syphonage pipes were provided for all traps; the ventilating pipes could also be used as a flushing pipe through which the whole of the contents of the overhead tanks could be discharged if it was ever found necessary to flush out the 6in. drain. The latrine was so close to the public road that the greatest care had to be taken in its construction so as to avoid all possibility of any nuisance.

The septic tank under the latrine was divided into two compartments—one measuring on plan 8ft. by 3ft. and known as the grit chamber, and a second, 8ft. by 15ft. The two chambers were connected by seven passages in the dividing wall, each measuring 5in. by 3in., and at a height of 3ft. from the floor, or practically at the same level as the mouth of the vertical iron inlet pipe. The object of the grit-chamber was the collection of the silt from the flushing water and the bits of brick that certain classes of natives prefer to use instead of washing water. The floor of the grit chamber was flat, whereas that of the septic tank sloped upwards towards the outlet pipe; the normal depth of liquid in the septic tank was 5ft. 3in. at the grit-chamber end, and 4ft. 6in. at the outlet end. The roof consisted of two arches carried by a central iron joist and the side walls. Following the Exeter example, the outlet from the septic tank consisted of 4in. galvanised wrought iron pipe with a slot cut in it throughout its length; there appears to be no particular advantage about this method of drawing off the liquid, and it is extremely problematical whether it does what is claimed for it, namely, to draw off the liquid evenly from the whole width of the tank. The discharging end of the pipe was fitted with an ordinary ball-cock so as to maintain a constant discharge. This was found to be a somewhat inconvenient arrangement, as it only permitted of one rate of discharge neither more nor less, and so a screw valve was designed and fitted. This did not prove satisfactory and caused much more trouble than the ball-cock, the reason being that the small quantity of matter in suspension in the effluent from the tank gradually accumulated and choked the valve; this state of affairs could not have happened with a ball-cock, because directly the rate of discharge became reduced owing to the accumulation of matter the ball drops and opens the cock more widely, and thus causes the accumulation to be flushed out by the increased discharge. The most satisfactory valve would probably be a ball-cock with the ball sliding on the arm so that it could be suitably adjusted for any desired rate of discharge.

Manholes fitted with cast iron covers were provided

in both the grit chamber and septic tank, as also sludge outlet pipes laid at floor level, so that the whole contents of the tanks might be discharged into the Calcutta sewers with the least possible delay. The height of the surface of the liquid in the tank was gauged by a plumb-bob passed through a hole in one of the manhole covers; except for this small hole, which was kept plugged as much as possible, the tanks were kept practically air and gas-tight, for no arrangements were made for drawing off the gas from the putrefying sewage, and no inconvenience has been felt. Before passing on to the filters the effluent was discharged over a triangular notch that served the double purpose of measuring and aërating it.

The filters were two in number, each measuring 13ft. by 8ft. 6in. by 4ft. 2in., and made of brick masonry; they were separated from the main tank structure by a space of 3ft. wide and running the whole length of the tank, the object of the chamber thus formed being to give room for the erection of automatic filling and discharging valves. No such valves were ever used, and the space was partially utilised for the erection of a small Scott-Moncrieff tray filter. The experiments of Professor Frank Clowes and others as to the capacity of filters filled with different materials, had not been made when these filters were designed, and they are really much too big for the quantity of effluent they had to deal with. It is generally reckoned now, as a rough approximation, that the air space, or the space available for occupation by a liquid, is one-third of the cubical contents of the filter chamber; no exact rule has been laid down on the subject, nor is such possible because of the varying character of the substances used for filtering material. In this experiment the filtering material consisted of a 3ft. depth of furnace slag in one filter and furnace-bar clinker in the other, laid over 9in. of brick *khoa;* the furnace slag varied from 1in. to ¼in., and the furnace-bar clinker from ½in. to ⅛in. diameter. Various devices were experimented with for discharging the effluent on to the filters, but no one arrangement gave better results than the other, and for the greater part of the time the effluent was discharged through two cocks straight on to the filtering material. When the filtering material near the cocks showed signs of getting clogged it was simply turned over and thoroughly exposed to the air; after a short time all traces of clogging had disappeared.

The filtrates were collected in two masonry wells or vats, measuring 4ft. 10½in. by 3ft. by 4ft. 3in., which were connected at first with the Calcutta sewers, but after a short time the filtrates were so satisfactory that the connection was stopped, and the filtrates allowed to discharge down a small masonry ladder into a low-level tank in the gaol garden. The maximum level of the water in this tank was practically the datum from which all the other levels of the installation had to be determined; it was desirable in the first place to ascertain what would be the result of the continuous discharge of partially-purified sewage throughout the year into the tank, and it was at the same time necessary that the filters should not be water-logged and thus prevent the ingress of air through the outlet valves while the filters were not in use.

There is no necessity to give a statement of actual cost of this experimental installation, as it would not serve as a guide in any way for the cost of equally efficient works in the mufassil. The latrine on the top of the septic tank is probably the best of its kind, but it had to be for reasons already given. The filters are much too big, and there is no necessity to make them water-tight. The cost of sewage disposal works on the septic-tank system is practically regulated by the rate for brick masonry, as there are no very special fittings required nor special work of any description. All that is required is a water and air-tight tank and three small filters with earthen banks, and a low-level tank into which the filtrates can be discharged. It may be possible later on to discharge the effluent from the septic tank direct into a roadside drain, provided that drain is lined with masonry, for the effluent is certainly not more offensive than the usual contents of such drains in crowded bazaars.

(*To be continued.*)

THE HYGIENE OF MUD.

The man in the street is apt to look upon mud with anything but friendly feelings, but according to the *Lancet*, there is a consolation even for the mud-besprinkled. This happy solace is to be found in a comparison between the hygienic effects of mud and its opposite condition of dustiness. Of course mud is, roughly speaking, wet dust, and dust is dry mud; but the evil effects of dust far transcend those of mud. In the dissemination of disease, mud remains comparatively innocent, but for the behaviour of dust in this respect no words can be too strong. Widely disseminated and inevitably inhaled, dust particles carry and deposit enormous quantities of disease. Its local and comparatively trifling damages, conjunctivitis, pharyngitis, and rhinitis, pale before its evil powers in carrying more formidable disorders. It has recently been shown how summer diarrhœa is wont to prevail most where there is most dust, and that dust may contain the dried sputum of phthisical patients is only too familiar to us all. These are only two of the graver diseases in the distribution and implantation of which ordinary dust plays a leading part. There are still other complaints in which the inhalation of ordinary dust is baneful, not to mention the special diseases caused entirely by special forms of dust, and our contemporary would have it borne in mind that mud has no similar evil influence. Mud is largely water. Paradoxical as it may sound mud is clean, at least as compared with dust. Moreover, the ultimate fate of mud is in the drain-pipe of the street, but dust too often ends in the windpipe of a man, if not in the alveoli even of his lungs. In future, then, let us not revile the passing Hansom, nor as we wipe from our collar the mud of London's winter streets too fully condemn it; but rather gratefully reflect that a passing inconvenience, a mere temporary disfigurement, is a small price paid for freedom from the evil possibilities of the dust of an apparently brighter day. The ideal street knows neither mud nor dust. But in a world of imperfections let us not too hastily condemn mud. Let us rather congratulate ourselves on the absence of dust.

The ceremony took place at Prescot, a short time back, of cutting the first sod of a new reservoir to be constructed there by the Liverpool Corporation for storage purposes. The land where the reservoir will be is a portion of the Knowsley estate, and it will adjoin the existing reservoir there, which is also used for storage purposes. The ceremony was performed by the Earl of Derby.

The St. Bride's Press Limited, 24, Bride-lane, Fleet-street, E.C., announce the immediate publication of a book on "The Theory of Engineering Construction," by Mr. Ernest H. Essex, A.M.I.C.E., assistant engineer and surveyor to the Leyton Urban District Council. The book will form a valuable work of reference for civil engineers and students, comprising as it does a selection of notes and formulæ on the theory of construction, arranged in the form of answers to the questions set at examinations for the election of associate members of the Institution of Civil Engineers. The price of the book is 5s. net.

THE HOUSING PROBLEM.

WOLVERHAMPTON AND ITS 2000 INSANITARY HOUSES.

Councillor R. E. W. Berrington recently delivered a lecture in the Wolverhampton Free Library Lecture Hall, on "The Housing Problem." Alderman Levi Johnson presided, and among those present were the Revs. W. T. Milligan and C. Dunkley; Councillors A. Weaver, C. P. Plant, E. White, and J. Jones; Messrs. T. G. Baker, S. M. Wright, C. Boyes, W. Knight, J. Elliot, J. Peers, H. Moreton, &c.

Alderman Johnson said that many who had attended that gathering were no doubt expecting to have a corner of the curtain lifted with respect to the report of the Housing Committee, which would shortly be submitted to the Wolverhampton Town Council; but as far as he was concerned, he had no intention of making known what that report was going to be before the proper time. He hoped to be able to place the report before the Council at the meeting in January. The subject of the housing of the working classes was one of the highest importance, and there was no one on the Housing Committee who knew more about it than Councillor Berrington.

Councillor Berrington said that as a member of the Housing Committee he was sworn to secrecy, but he could tell them that there would be something good in the report of that Committee. In Wolverhampton, the housing of the artisan class was being fairly dealt with by private enterprise, but the very poor had not been touched. No town in England had dealt with the housing of the poor, but with that of the artisan class. Wolverhampton had an immense amount of slum property, and sooner or later it would have to be dealt with. There were people living in the slums who ought not to be there, because they were getting good wages, and ought, for the benefit of their families, to live in better houses. People died three times as fast in slums as they ought to die under normal conditions. In Birmingham Dr. Hill had stated that there were 10,000 houses that were quite unfit for occupation, and he (the lecturer) had said that there were 2000 houses in Wolverhampton that were unfit for occupation. He should have no difficulty in proving what he had said. In Wolverhampton they had a population of 95,000, and there were 20,600 houses, or 28 people on every acre. In St. James's and St. Matthew's Wards there were at least 600 houses that were in an insanitary condition, but such houses were not confined to one or two particular wards, for they were dotted all over the borough. Many of the people in the slums paid 1s. 9d. or 2s. 6d. per week, and he thought that the landlords made a good thing out of the rents, for such property could be erected and be made to pay 10 per cent. In Wolverhampton there were 3000 houses with rents ranging from 1s. 9d. to 3s. 3d. They had 1695 people in receipt of out-relief in the borough, with 616 children, and 659 widows in receipt of relief, and he thought that that was a workable number to deal with. The wonder to him was how people lived in the slums, for he could not conceive how people could be good or honest among the surroundings they were in. With cheap tram-fares they might induce many people to live some distance from where they worked. If anyone wanted to spend a pleasant day, he should advise them to visit Bournville, near Birmingham, and see the artisans' dwellings there. Even close to Wolverhampton—at Wednesfield—something was being done in this direction, for in connection with the chocolate works erected there, houses were being erected for the workpeople, where they would be away from the smoke. If the slum property of Wolverhampton were got rid of the rates would be lowered. Slum properties were disease centres, and to remove them they must have the co-operation of the owners. He would rather die poor than continue to draw rents from slum property. When old houses were pulled down, and new dwellings erected, the old bricks must not be used again, for bricks breathed, and in the insanitary houses had been breathing filth for the last seventy years.

Mr. T. G. Baker, in moving a vote of thanks to Mr. Berrington, said that although the hall had not been filled to listen to Mr. Berrington's lecture, the meeting was a representative one, for they had representative working-men present, and there were also representatives of the clergy, who had been working for the better housing of the poor all their lives. In Wolverhampton they had property owners exploiting the poor in order to get 10 or 15 per cent. dividends, but yet those were the people who complained about the rates.

Councillor White seconded the motion. He said that from the first day he left college he had taken the greatest interest in the question of the housing of the poor. At one time he used to spend three nights a week and every Sunday in the East End of London, in the district at the back of Shoreditch Church, and it was there that he found his wife, who was working in a ragged school. The great difficulty he found in moral and spiritual work was the hovels in which the poor people lived. He found seven or eight persons living in a single room, and had seen a corpse laid out on the table of a room in which there were several people drunk. He determined that if ever he became a member of a Council he would make the housing question his one great point. He hoped that when the Council erected dwellings they would have the right people living in them, for the people they wanted to help were the abject poor, who could not help themselves.

The motion was carried, and Councillor Berrington replied.

Alderman Johnson, in reply to a vote of thanks to himself, said that the Housing Committee were making sacrifices of time on the question, and it was the deserving poor, and not the spendthrifts, that they wished to help.

ELECTRIC TRAMWAYS AND ASPHALT PAVEMENTS.

Various attempts have been made in Germany to devise a means whereby the destructive influence exerted by the passage of heavy electric tramcars upon asphalt pavements may be counteracted. Hitherto, says a German trade review, these endeavours have been without definite result, but much has been said lately in praise of a system which is shortly to be subjected to a practical test in Berlin. Contrary to ordinary practice, in which the tram lines are laid upon a foundation of concrete, further resting in direct contact with the superimposed asphalt, the new method consists in laying the rails upon a bed of coarse gravel and running a line of hardwood blocks along either side. Experience has taught that ordinary pavements with gravels and stone foundations in place of concrete offer the greatest resistance to the influence of electric cars. It is assumed that the gravel or stone allows the rails more play, which is advantageous in that, despite great care in their manufacture, it is impossible to ensure exact uniformity with the gauge of the cars. The new method is also relied upon to reduce the noise caused by the cars running over the lines.

Having regard to the recent arsenic scare, the Edmonton District Council has authorised its Medical Officer and Sanitary Inspector to take samples of beer whenever they have any suspicion concerning it.

THE PURIFICATION OF SEWAGE.

An interesting address on the purification of sewage was recently delivered to the Architectural Association of Ireland by Dr. Adeney.

Dr. Adeney stated that after several years of doubt and uncertainty, the purification of sewage had become generally recognised as a matter for its own micro-organisms to effect, and what the chemists and engineers had to do was to make provision for the conditions which had been discovered to be necessary to keep the micro-organisms of sewage healthily and busily engaged in exercising their true functions, that is the oxidation of the polluting matters with which they were associated, and to prevent them from becoming, what they certainly would be, if subjected to conditions unsuitable to their own healthy life processes—a danger to health. The necessary favourable conditions, and the amount of work which these micro-organisms were able to perform in the way of purifying large volumes of sewage had to a great extent been worked out by the efforts of a large army of investigators in these countries, in America, and on the Continent, and it was gratifying to be able to state that Irish workers had borne an honourable part in advancing our knowledge of this great subject. One condition was absolutely essential for these organisms, and that was an ample and constant supply of oxygen. The actual amount of oxygen required for the purification of a given volume of average town sewage after the solid matters in suspension had been removed from it, could now be determined with great accuracy by a method suggested and worked out in this country. It has been shown from investigations carried out in the laboratory during the years 1890-95 that an average town sewage, after the solids in suspension had been separated from it, required one and a-half times its volume of air to supply the volume of oxygen required by the micro-organisms of the sewage to effect the complete purification of the same. These figures have since been completely confirmed by experiments carried out on a large scale. It was not so difficult to supply large volumes of town sewage with the air required for their purification as might have been expected. The real difficulty had been, and was still, that of expense. One of the easiest ways of supplying the necessary oxygen to sewage was by diluting it with good river or sea water. Forty volumes of either contained an ample store of dissolved atmospheric oxygen to supply the organisms for the oxidation of the polluting matters in one volume of standard town sewage after the solid matters in it had been removed. Hence, when a populous city like that of Dublin is fortunately situated on a tidal river, with a strong ebb current to the open sea, its sewage is easily and satisfactorily disposed of, by first separating the solid matters it contains and then discharging the liquid portions on the ebb tide only, and as near to the mouth as possible. This statement would, no doubt, surprise many in Dublin, accustomed as they were to the foul state of the river Liffey, but this was because the sewage had been from time immemorial discharged into it in ignorance of all principles. Were the solids first separated and the liquid portions discharged only on the ebb tide, and near to the mouth of the estuary, it would do no more harm than had the Rathmines and Pembroke sewage, which had now been discharged into the estuary for the last twenty years. When towns are less fortunately situated the problem of the purification of their sewage became much more complicated. In addition to having to furnish the large volumes of air a large army of organisms had to be cultivated and concentrated in a small area. Both these conditions were most efficiently satisfied by filtration through suitable porous land or through artificial filter beds. After the filter had been in use for a short time, organisms commenced to grow upon the surfaces of the material forming the filter; they then multiplied with enormous rapidity and soon covered them with semi-transparent masses of organisms which oxidised, with astonishing rapidity, the organic matter in the sewage, as it passed over them in thin film-like streams, the oxygen being supplied from the air in the insterstices of the filter. After a time this supply of oxygen became exhausted, and the passage of the sewage through the filter was stopped to allow the air in the interstices to be renewed. The filter might then be employed again, and so on for a long time. Besides being the most efficient means of purification, filtration is the quickest, effecting the purification in the course of a few hours. The size of the filter beds required for the purification of the liquid sewage of a given town could be easily calculated, when the volume of air required for its oxidation had been ascertained by the method above referred to, since the organisms always required like volumes of air for the purification of like volumes of similar sewage, and since the total volume of air in a filter might be taken as equal to one-third its own volume. It had been calculated from laboratory experiments that three acres of filtering bed 3ft. thick could purify 1,000,000 gallons of liquid sewage, supposing the filter to be filled three times every twenty-four hours. These calculations had recently been confirmed by Mr. Mansergh, President of the Institution of Civil Engineers, London, in a report to the Sheffield Corporation. The one great objection to filtration was that of cost. It was to get over this difficulty that Mr. Kaye Parry and the speaker had suggested the addition of small quantities of nitre, which could furnish oxygen in a condensed form to the organisms as a substitute for nitration. There was a second important question in the sewage problem, that was the separation and disposal of the solids of sewage, and this had proved in the past quite as difficult as that of the liquid portions of the sewage; but with our present knowledge of the chemical and biological principles underlying this part of the problem there need not be any doubt that all difficulty in its practical solution would soon be overcome. By means of the septic tank it seemed possible to satisfactorily dispose of about 50 per cent. of the solids. The septic tank was simply an open cesspit, on the surface of which the solids were allowed to accumulate until they formed thick crusts completely covering the surface, and gradually rising above it for several inches. In this condition the solids became drained and freely exposed to the air, and were then rapidly oxidised by their own organisms. But the septic tank only disposed of 50 per cent. of the solids. Mr. Kaye Parry and the speaker had, however, shown that the solids could be satisfactorily disposed of in accordance with bacterio-chemical principles by precipitating them by means of certain compounds of manganese. The solids were then separated, and at the same time were mixed with certain oxides of manganese, which contained oxygen in a combined or, as we may term it, in a condensed form that could be utilised by the organisms. When the separated solids and oxides of manganese were stored in heaps the solids did not become offensive, but underwent slow oxidation until they were completely oxidised and could be safely used as valuable manure. Dr. Adeney said, in conclusion, that he trusted he had said enough to show that the disposal and purification of sewage on a large scale was from beginning to end a work for its own micro-organisms to perform, and that the conditions most favourable for keeping them healthy and constantly employed, and all maximum amount of work they could do, are all factors in the great problem of sewage purification, which were gradually becoming more and more clearly visible and attainable as the reports of each new effort to bring the organisms into operation on a large scale were published.

National Health Society.

OFFICIAL TRANSACTIONS.

Six lectures on "Sick Nursing" will be delivered by Sister Katharine (Lecturer to the National Health Society, and late of St. Bartholomew's Hospital), in the Committee-room, 53, Berners-street, W., on Thursday, January 24th, 1901, and five following Thursdays, commencing at 3.30 p.m. The fee for the course is 10s. 6d. Tickets and syllabus to be obtained on application to the Secretary at the office, 53, Berners-street.

The following is the syllabus of six lectures on "First Aid to the Injured and Sick," to be delivered by J. Cantlie, M.A., M.B., F.R.C.S., in the Committee-room, 53, Berners-street, W., commencing Monday, January 28th, 1901, at 3 p.m.

Monday, January 28th.—Lecture I.—First Aid to the Injured: what it means. The structure and function of the human body, including a brief description of the bones, joints, and muscles. Dislocations. Sprains and strains. Practice: The triangular bandage, and how to use it.

Monday, February 4th.—Lecture II.—Hæmorrhage: Arterial, venous, and capillary. The circulation of the blood and the position of the main arteries. How to treat arterial bleeding in various parts of the body. Bleeding of varicose veins, from the nose, the lungs, and the stomach. Practice: Digital compression of arteries, and the application of tourniquets.

Monday, February 11th.—Lecture III.—Fractures: Causes, varieties, and signs of fracture. Treatment of wounds. Practice: Application of temporary splints.

Monday, February 18th.—Lecture IV.—Insensibility: its various causes, and how to tell them. The nervous system. How to aid the fainting, those suffering from epileptic and apoplectic fits, from sunstroke, shock, injuries to the brain and spine, stunning, hysterics, intoxication, and opium poisoning. Practice: Application of the roller bandage.

Monday, February 25th.—Lecture V.—General Ailments: Foreign bodies in the eye, ear, and nose. Bites and stings. Hydrophobia. Burns and scalds. What to do when the dress catches fire. Frost bite. Organs of respiration. Choking. Hanging. Suffocation. Drowning. The restoration of life in the apparently drowned or otherwise suffocated. Practice: How to perform artificial respiration.

Monday, March 4th.—Lecture VI.—Poisons: their effect and treatment. Organs of digestion. Carriage of injured or sick persons. Practice: General recapitulation.

Each lecture will last about an hour, and will be followed by half an hour's practical work, in which those attending the lectures will have opportunity of taking part. Tickets and syllabus of the lectures may be obtained at the office of the National Health Society, 53, Berners-street, Oxford-street, W. Fee for the course, 10s. 6d.

Sanitary Inspectors' Associations.

Midland Branch.

Last Saturday the members of the Midland Sanitary Inspectors' Association visited Wednesbury for the purpose of inspecting the Corporation Sewerage Works at Bescot. In the course of the afternoon they were received in the Council Chamber by the Mayor (Councillor Knowles), by whom they were afterwards entertained to tea.

AN IMPROVED FILTER CLOTH.

An improved filter cloth for sewage sludge, yeast, wine, and other presses has been designed and the patent applied for by Mr. W. J. Bosley, superintendent of the sewage and house refuse disposal works of Southampton, and others. This invention is designed to meet the requirements of a cheap and effective cloth for filter presses. Much trouble has previously been experienced in dressing filter presses, owing to the bad and inferior system of jointing in the centre, and which resulted in bad filtration, blockages of the water channels, and oftentimes a breakage of press plates.

On the improved method the centre holes are cut true to size, according to the size press in use, and are jointed in the centre by a strong webbing, which obviates the whole of the difficulties above mentioned, the result being that the cloths lie perfectly flat on the surface of the plate. The centre hole offers no obstruction to the matter forced into the filter presses, and the space allowed by makers of filter presses between each chamber remains perfectly free.

No leakage can possibly take place where the cloths are stitched, which has hitherto been a source of trouble, as the whole are double-stitched by a specially designed machine. Those now in use prove their efficiency in filtration, as the plates remain perfectly clean and there are no breakages. The cloths last longer than the ordinary made cloth, yet cost no more, owing to their being manufactured by machine, which has dispensed with the tedious hand work.

A forty-eight chamber press can be dressed in one hour. These cloths have met the desired requirements by the manufacturers of sludge and other presses, and also have the approval of the leading sanitary engineers of the day. In connection with these cloths a simple, economical, and effective clip is designed to hold the cloths in position, which makes the whole arrangement one of simplicity and cheapness, combined with durability and efficiency.

WELSH WATER AND THE TEETH.

Birmingham, according to a statement made at the forty-first annual meeting of the Dental Hospital, is likely to want a great many dentists shortly. Emphasising the necessity of a new hospital, one of the speakers said that since Glasgow had had its water from Loch Katrine dental caries and rickets had largely increased in the city. In South Africa the same effect of using soft water had been observed among the natives. He had inquired as to the percentage of recruits for the army rejected on account of bad teeth and found that of the recruits from Birmingham it was very small indeed. This was attributed to the hardness of the water drunk in Birmingham. When they got the soft Welsh water they might expect to have a large increase of dental caries, and it was important that they should prepare for this by having a better-equipped hospital.

The Lord Mayor thought these remarks constituted a very strong argument in favour of the new hospital, though he felt rather dismayed at such a statement because the special quality for which the Welsh water was recommened was its softness.

The Ven. Archdeacon of London (Dr. Sinclair) has consented to preside at the annual dinner of the Sanitary Inspectors' Association, to be held at the Holborn Restaurant on February 2nd, 1901.

MUNICIPAL ENGINEERING & SURVEYING.

CROSS-TABLE CHAT.

I ADVERTED a few weeks ago to the absence in bye-laws as to new buildings made under the Public Health Acts of any clauses regulating the materials to be used for the internal plastering of houses. The omission in the Building Bye-laws and powerlessness of Local Authorities to restrain the use of improper materials has been discovered by that *honest* individual—the speculative builder—and as a consequence he finds it profitable to use garden loam, in lieu of sand and hair, for his coarse stuff, and as a consequence the ceilings of such houses almost invariably fall down within two years after construction, to the serious loss of both the new owner and tenant.

THE builder knows full well when using such material that it is a dishonest and fraudulent practice, but he has no qualms of conscience except when the arm of the law, instituted by Sanitary Authorities, threatens him. He is ever protesting against what he terms the interference with the liberty of the subject caused by the enforcement of bye-laws and as to the injustice of a man not being able to do as he likes with his own property—a species of claptrap which is found to influence the weak-kneed and less intelligent class which is sometimes found among Councillors.

IT would, however, appear that Sanitary Authorities are not justified in leaving any discrimination to, or trusting to the rectitude of, the speculative builder; and the Local Government Board, who until quite recently were adverse to the inclusion of any clause in building bye-laws regulating the materials to be used for the plastering of houses, have now withdrawn their objections, and approve bye-laws as to new buildings containing clauses as to plastering made under Sec. 157 of the Act of 1875, and among towns which have obtained such a clause I notice that Hove has obtained such.

THE clause in the Hove bye-laws is, however, it appears to me, not nearly so satisfactory or conducive to sound work, and also to facility of proper interpretation, as that in the bye-laws of the London County Council, which prescribes that "All laths used for plastering shall be sound laths free from sap, &c. Plastering or coarse stuff shall be composed of lime and sand in the proportion of 1 of lime to 3 of sand, mixed with water and hair. . . . . The lime to be used must be freshly-burnt lime. The sand must be clean sharp sand, free from loam or earthy matter. The hair to be used must be good and sound, and free from grease or dirt; 1 lb. of hair to be used to every three cubic feet of coarse stuff," &c. Such a clause as the above obviates all disputes, and I would advise those of my readers who contemplate having a similar clause introduced into their bye-laws to obtain it in full, which can be found in Banister Fletcher's "London Building Act, 1894," price 6s., which is a text-book for architects, surveyors, builders, &c.

IT will be doubtless of some interest to my readers to learn that the Local Government Board now also approve bye-laws regulating the construction of drains to existing or old houses, and that a number of Local Authorities have adopted such bye-laws, and the same are already in force. Such bye-laws also provide for separate drains for conveying sewage and storm water, and enable the Sanitary Authority to enforce inspection chambers with proper covers at each point in a drain where a change of inclination or direction is necessary. It has long been doubtful in the eyes of our legal friends whether Sanitary Authorities could enforce separate drainage and also whether inspection chambers could be enforced on drains. Their doubts may, however, be now set at rest, and Municipal Surveyors may, by their Authorities adopting such bye-laws, ensure more efficient work than would otherwise be possible.

MUNICIPAL Surveyors and Architects are frequently required to execute schemes for lighting buildings by gas, and are required to exercise the same control over the fittings as over other branches of building. It is essential in fitting a building with gas pipes that an equal distribution of gas be provided, so that when fully lighted the pressure is equal at all points on the same level. There happens to be few hand-books which are of much service in guiding the architect in such work, and I have therefore pleasure in drawing attention to the excellent little hand-book, viz.:—Stott's "Architects' and Surveyors' Hand-book of Gas Fitting," price 6d., published by Messrs. James Stott and Co., the well-known lighting and heating engineers, of 34, Queen Victoria-street, E.C. There are no abstruse formulæ to be worked out by the reader, for these have been done for him, and tables and tests, which are readable at a glance, are furnished, and a form of specification is given. The little book will be found very helpful.

I SUPPOSE that five years ago Acetylene as an illuminant was unknown in this country. At the present time, however, it is used for a numerous variety of purposes—from the lighting of small towns, from one common generating station, and for isolated buildings and railway stations down to portable lamps for contractors—also for table use, and for bicycles which generate their own gas. The light given off is bright and steady. It does not consume so much oxygen as coal gas, nor vitiate the atmosphere of a room to the extent that coal gas does, and it is cheaper, light for light, than coal gas. The disadvantages, until comparatively recently, attendant upon its use were the danger of explosion from the storage of calcium carbide, from which it is manufactured, and the cost of manufacture of the latter material. These disadvantages have now been considerably reduced by the construction of factories in Great Britain for making the compound, and by the introduction of numerous forms of apparatus for the manufacture of the gas from carbide of calcium in a portable, safe, and economical method, by new companies which have lately come into existence, such as the "Phos" Acetylene Gas Syndicate, Limited, 1A, Shacklewell-lane, Hackney, N.E., and Worsnop and Co., Limited, Carlton Lamp Works, Halifax, who manufacture self-contained lamps; the Forbes Acetylene Gas Company, Regent-street, Kensal Green, London, W.; Turr's Acetylene Gas Syndicate, Limited, Orchard-street, Great Smith-street, Westminster, S.W.; Thorn and Hoddle Acetylene Company, Limited, 1, Tothill-street, Westminster, S.W.; and numerous others who manufacture plant for installations for hall, homestead, hamlet, and factory, whilst the Acetylene Illuminating Company, Limited, of 3, Victoria-street, Westminster, S.W., have established a large factory at the Falls of Foyers, in Scotland, for the manufacture and sale of carbide of calcium.

THOSE of my readers who may be called on to advise as to the lighting of villages or isolated institutions or buildings would do well to inform themselves of the system, as it will without doubt be applicable in such cases, and its extension in a variety of ways may be looked for. The little town of Portsoy, in Banffshire, was the first in the kingdom to adopt acetylene as an illuminant over two years ago, and the chairman of the Local Council reports, after two years' working, that there had been no hitch nor trouble nor disappointment with the plant (which was constructed by the Manchester Acetylene Gas Company, Limited, Manchester), and that Portsoy is the best lighted town in Scotland of

its size. There are now many other villages in the kingdom which have adopted the light, and I doubt not that there will be a rapid extension of the system generally, as the cost of an installation is much less than that of a coal-gas plant.

I NOTICE in a return recently obtained relating to refuse destructors that in the six important towns of Bradford, Brighton, Birmingham, Leeds, Manchester, and Salford, there is provided on an average one cell to every 9000 inhabitants. Bradford has the largest number of cells for its population, having one to 6740 inhabitants, and Brighton has the least, viz., one to 10,220 inhabitants. The average capacity of these destructor cells is 5 tons per day, and the average number of working days in a year is 300. The Horsfall destructor continues to be, I notice, widely adopted, and to give excellent results. Those of my readers who require a good book on this subject should procure Maxwell's "Removal and Disposal of Town Refuse," price 15s., which is a veritable mine of information about destructors and refuse collection and removal generally, and is, I believe, the only impartially written book on refuse destructors to be obtained.

IT is singular that Local Authorities and their Engineers should so commonly fall into the error of honestly believing that the heat generated from the burning of house refuse in dust destructors is of such power as to be able to generate sufficient steam for driving the electric lighting plant for their towns. Such a common delusion should have been exploded long ago, but it still survives—in the specious arguments of interested patentees. The calorific value of house refuse is generally very small, and varies in each town. The refuse of towns adjacent to coalfields, or of a district like Shoreditch, in London, which is the centre of the cabinet-making industry, may be of commercial value in a destructor, but in a large number of cases its value is practically worthless, as many Authorities have found to their cost, and it is time that municipal engineers candidly advised their Local Authorities of the true position.

THE mistaken notions on this subject are to be traced to a statement made by Professor Forbes, in his Cantor lectures, before the Society of Arts in 1892, who said that, "*If* that refuse (at Paddington) were *properly burned*, and *if it were used in the most economical way*, it would be found that, assuming the proportion of lighting required for such a population to be, as has been very generally assumed, one lamp per head, the amount of refuse provided by any population is almost exactly as much as is required to supply the illumination by means of the electric light to that same population."

IN actual practice the conditions suggested by the Professor are unattainable; refuse is not burned under the perfect plans intimated, and the theoretical man, has, it is seen, been the cause of perpetuating the *ignis fatuus*. It may be remembered that between twenty and thirty years ago, when sewage disposal works were first being constructed in this country, that chemists prophesied from a similar theoretical standpoint that sewage could be treated at a profit to the community, and this was provable, it was urged, by the quantity of phosphates which were known to be present in all sewage, and which were to be abstracted, utilised, and sold at prices ranging from £3 to £12 per ton. Experiment has shown that all this was but an idle dream. But the fallacy was believed for nearly twenty years. Will the fallacy as to the supposed high calorific value of house refuse obtain credence for a similar period? SENEX.

PERSONAL.

MR. A. HUDSON has been appointed Clerk of Works for Guildford.

MR. R. H. HERRING has been appointed Inspector of Nuisances for High Wycombe.

DR. STEWART has been unanimously elected Medical Officer for Bovey and Islington.

MR. THOMAS F. BROWN has been appointed Sanitary Inspector for the burgh of Kilwinning.

THE Ripley Urban District Council has accepted the resignation of Mr. R. Argile, Surveyor to the Council.

DR. BROWN MOIR, of Stranraer, has been unanimously appointed Medical Officer for the Clenock Joint Hospital Committee for the ensuing year.

DR. THOMAS J. FOX, who was recently in Ballinalee, County Longford, has been elected Medical Officer for the Milltownpass Dispensary, under the Mullingar Guardians.

DR. W. BEAUMONT, Medical Officer of Health for East Ham, is to receive an increase of £50 per annum because of his extra duties. The present salary of the Medical Officer is £150 per annum and £50 for hospital duties.

DR. JOHN MCKENZIE, L.R.C.P., and L.R.C.S., Royal College of Surgeons, Dublin, has been appointed Medical Officer to the Sunderland Medical Association which has just been formed in the town by the local friendly societies.

THE Bridgnorth Rural District Council has decided to increase the salary of Mr. R. E. Hughes, Sanitary Inspector, £20 per annum, subject to the sanction of the Local Government Board and on the condition that he keeps a horse and trap for his own use.

LAW CASES.

Infringement of the Public Health Act.

AT the Gravesend Police-court, last week, Henry Parry, the master of the steamship Monterey, was summoned by the Corporation of London, as the Port Sanitary Authority, for an infringement of the Bye-laws made under the Public Health (London) Act, 1891, in failing to report to the Medical Officer of Health on his arrival at Gravesend, a case of dangerous infectious disease, namely, typhoid or enteric fever.

Mr. LEWIS NOAD represented the owners, Messrs. Elder, Dempster, and Co., of Liverpool; and Mr. T. G. VICKERY, the Assistant City Solicitor, appeared to prosecute on behalf of the Corporation.

Mr. VICKERY stated that the vessel arrived at Gravesend on December 7th, and was visited by the Medical Officer of Health in conjunction with officers of her Majesty's Customs. In reply to the question whether all were well on board, the master stated "all well," and subsequently signed a declaration to this effect, and further that there had been no case of sickness during the voyage. On the following day it was found that the fourth engineer had been taken ill with typhoid fever on November 14th, and had been under treatment by the surgeon of the vessel since that date, with the full knowledge of the master, who had entered the fact in his official log, and had also reported it at Havre. The Medical Officer of Health thereupon removed the patient to the hospital and disinfected the vessel. These facts were not disputed by the defence, and Mr. NOAD, on behalf of the master, pleaded guilty, and stated the circumstances in which the offence was committed.

The Bench imposed a penalty of 40s. with costs.

NOTICES.

ANNUAL SUBSCRIPTIONS.—The Annual Subscription to "THE SANITARY RECORD," for the United Kingdom, paid in advance, is 12s. 6d. For the Colonies and Abroad, 15s This includes postage, and a Copy of the Diary, post free.

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The Sanitary Record
AND
Journal of Sanitary and Municipal Engineering.

JANUARY 4, 1901.

CAMP AND BARRACKS SANITATION.

AMONG other important matters affecting the welfare of the Army which will have to be considered when the "New Broom" is called into operation is the question of a more efficient system of sanitation for camps and barracks. Many of the latter leave much to be desired in this respect, while the former still rejoice in methods which are altogether primitive and effete. The sanitary needs of armies in time of war have been forcibly brought home to us in South Africa, where, despite precautions, the number of deaths from enteric have been appalling; but while much is pardonable during the exercise of war, when the energies of the staff officers are tried to the utmost in other directions, there is no excuse whatever for the neglect of sanitary precautions in times of peace. Unfortunately evidence is not wanting that such neglect exists, and its influence upon the health of the Army as a whole is much more serious than appears upon the surface. In the ordinary course, where civilians and Medical Officers of Health are concerned, we are kept well posted by means of periodical reports; but, strange to relate, statistics regarding the Army, bearing directly upon sanitary matters, never find their way into the office. We are well aware that "Crown" property does not come under the jurisdiction of the Civil Authorities, but surely that is no reason why the latter should be kept in the dark. On the contrary, the fullest information should be given them, for the insanitary condition existing in barracks or camps constitutes a direct menace to the neighbourhood in which these institutions are located. An instance of the crude material of which Army sanitarians are made is furnished by a recent letter by a regimental officer to the *Times*. This correspondent suggests covered receptacles or a trench 4ft. deep for camp latrines! As every student of sanitary science knows, this depth affords exactly the *nidus* most calculated to prolong the life of pathogenic microbes, to whom light and air penetrating a shallow trench is fatal. This is only a small point, but it serves to illustrate the fallacy of Aldershot training in these matters. At the same time we must recognise the spirit which prompts a regimental officer to exercise any interest whatever in the sanitary regulations of camps. There is altogether too much indifference to the subject in Army circles, and if Lord Roberts will take this matter in hand with his accustomed far-sighted thoroughness, its effect on the rank and file of the Army will be bound to make itself felt in increased physical efficiency and general well-being.

Social Science Progress.

THE writers in the newspapers have this week been revelling in retrospects of the past century, yet very few have even noticed the greatest and most real advances which it witnessed. Political history has been reviewed, the wars—great and small—have been recounted; the triumphs of steam on land and sea; the discovery and development of electricity—all these and many other things have been set forth, but very little reference have we seen to the immense changes which have come into the lives of the people as the result of the labours and teaching of Southwood Smith and Edwin Chadwick, and the noble band of sanitarians who have followed in their wake. It is to the work done by these that we owe the improved condition of our cities and towns. If the country had been unmindful of the truths they taught, and there had continued the utter disregard of the elementary laws of health so prevalent in the early days of the century, existence would have been impossible in the congested masses which are the feature of the

national life to-day. We rejoice, with every true patriot, in the growth and expansion of our glorious empire; but we are even more deeply thankful for the fact that the advances made in social science have stamped out the pest-houses and fever-breeding dens of our forefathers; that the improved surroundings due to the same cause have added many years to the lives even of the poorest. These are the bloodless victories of the century, and, to our mind, of greater importance to the commonwealth than anything else.

A Case for Inquiry.

Some trenchant criticisms are offered in last week's *Syren* on a case mentioned in the report of Dr. Collingridge, Medical Officer of the Port of London Sanitary Authority. It appears that on May 5th the Authorities in London received information from Stalybridge of a fatal case there. The patient had travelled from Moscow to Stalybridge *viâ* Flushing and Queenborough. The eruption of small-pox had broken out before he left Moscow. How was it then he was passed at the landing-place in this country? Queenborough is within the jurisdiction of the Port of London Sanitary Authority, so this is evidently the body responsible for allowing a disease-stricken patient to travel from the Medway right through the heart of England to a populous centre of Lancashire. Of excuse for, says our contemporary, or an explanation of, this fearful neglect, we find no trace in the report before us. Why is this? What attention has been given to the matter by the Port Sanitary Committee? Any, or none? We know that the staff is too small, and have said so time and time again; the Committee admit the fact on page 11 of the book before us; they have admitted it since 1883, seventeen years ago. Why, then, have they taken no steps to increase the number of inspectors? We have never encountered a graver dereliction of duty, and we hope such steps will be taken in Parliament as shall either end or mend a system which permits a disease-reeking patient to be sent from one end of England to another, exuding contagion on every mile of his journey. Small-pox checking at Queenborough may not be so likely to appeal to the public as plague hunts at Gravesend, but it is nevertheless necessary. The fact that it is possible to even land a small-pox patient from a foreign vessel is not likely to increase confidence in our Port Authorities. But it passes our comprehension that anyone should have been allowed to transport such a person from one end of the country to the other.

The Leeds Mystery.

The ways of some municipalities are strange. For many months —we had almost written years— a Committee of the Leeds City Council has been seeking for a solution to the problem of how best to dispose of its sewage. Experiments on a most extensive scale have been carried out, and advantage has been taken of the very latest investigations and suggestions of the leading chemists and sanitary engineers of the day. The industries of the city and conditions of life introduce special elements into the sewage, but it has been found that these could all be treated successfully by bacterial methods. In fact, the reports issued by the Committee seemed to indicate that there had been discovered a combination which would meet every requirement set forth in the instructions given to it as a guide for its investigations. Such, however, does not appear to be the opinion of the City Council. Among the municipal Bills deposited for next Session we find one promoted by Leeds for dealing with its sewage. But in it the results of the Committee's work are entirely disregarded. Instead of treating it, as was possible, near at home, an expensive main drain, twelve miles long, is to be laid down, and the sewage conveyed to an immense farm, some 1890 acres in extent, for treatment. The estimated cost is £650,000, but more probably will it be three-quarters of a million. Surely there is something in all this calling for explanation. That the cost of any scheme for such a city must be considerable we willingly admit, but we do contend that modern science has made it possible to do without this profligate purchase of land and laborious tunnelling. On one-tenth of the space a thoroughly efficient scientific system could have been established. We have always given Yorkshiremen credit for being progressive in their municipal life, but when they seriously propose a scheme on the lines accepted forty years ago, and which are discarded by the engineers of to-day, it is time to review our belief in their longheadedness and wisdom. The whole thing is a mystery, and we are tempted to ask whether the farm was purchased before the Committee began its inquiries, or did it come into the hands of the Council through the friendly interposition of interested parties. But perhaps somebody will explain.

Helping the Red Cross.

One of the news agencies gives an interesting account of a novel appeal which has been made this week throughout America on behalf of the Red Cross Society of that country. It would appear that the officers of the society have recently been engaged in collecting messages of appropriate nature from notable people all over the world. Official sanction has been given to the enterprise by the State Department, which has lent all the assistance in its power to the society. The result has been a wonderful collection of documents, in which Kings and Queens, Princes and Presidents, and the foremost men and women of the present day, express their ideas on the dying of the old century and the dawning of the new. All over the United States it is the custom to watch the new year in. The Red Cross Society, therefore, conceived the notion of getting together this collection of messages, and selling a copy of them to every party which was following the universal custom, whether at a watch-night service, a private or public dinner party, a dance, a private house, or a club. Thousands of copies were made, and the services of all the express companies in America enlisted for their

distribution. The charge for a copy was 25 dollars for each party. They were delivered everywhere at eight o'clock on the night of December 31st, on the understanding that the messages were not to be read until midnight had struck. The original documents will be bound in a volume which will be deposited in the Congressional Library at Washington as a unique and valuable record of the occasion.

London's Vital Statistics.

With the close of the year was issued the report of Dr. Shirley Murphy on the health of the administrative County of London in 1899. This report is no mere copy of its predecessors, with just the figures corrected. It is an exhaustive analysis of the condition of the entire metropolis, and contains much valuable material worthy the study of all interested in municipal life in general, and that of London in particular. In a future issue we hope to deal more fully with its contents, but at present we must be content to refer to that portion giving the vital statistics. Dr. Murphy estimates the population of the county in the middle of 1899 at 4,568,689. In the year under review there were 41,853 marriages, giving an annual rate of 18·4 per 1000. The number of births registered was 133,585, giving an annual rate of 29·3 per 1000, which is the lowest birth-rate on record in London. During the year the eastern group of districts had the highest birth-rate (36·2) and the western the lowest (24·6), the northern, central, and southern groups having birth-rates of 27·2, 28·6, and 30·0 per 1000 living respectively. As in the preceding year the district having the highest birth-rate was St. Luke (44·4), and the district having the lowest birth-rate was St. Martin-in-the-Fields (12·2). The number of deaths was 87,819, giving an annual rate of 19·3 per 1000. All the eastern districts and all the central districts, with the exception of St. Martin-in-the-Fields, had in the year 1899 death-rates above the average of London. The district of St. Luke had the highest death-rate (30·7) and Hampstead the lowest (13·4). The deaths of infants under one year of age was 22,209, being in the proportion of 166 per 1000 births. During the year 1899 the eastern group of districts had the highest infant mortality (179), the northern the lowest (154), the infant mortality of the southern, central, and western groups being 164, 168, and 173 respectively. Of the districts, Holborn had the highest (226) and Stoke Newington the lowest infant mortality (103).

The City of the Future.

The ubiquitous interviewer was in strong evidence in Tuesday morning's papers, and men of all creeds and classes were enabled to give their views on the work done in the past century, as well as the tasks awaiting accomplishment in the present. The idealist was given full play for the exercise of his faculty. In this respect, Mr. Robert Donald, who has done much to awaken an interest in municipal affairs, sets forth in the *Daily News* his belief of what will be the condition of the city of the future. In reply to a query as to whether overcrowding will exist in the cities of the new century, he gives an emphatic "No." "Before the new century has run its course," he continues, "the conditions of to-day will be regarded as belonging to the horrors of the dark ages. The herding of the sexes in one-roomed dwellings will be to them a thing unspeakable. The death of one-fourth of the children in the poor parts of London before they are a year old will appear to them as barbarous. The city of the new century, spread out over a wide area, with plenty of light and air for all, will contain no slums. Disease will be reduced to a minimum; the unfit will disappear, as medical science will check physical degeneracy and strengthen the weaklings." Asked, "Will the towns of the new century, then, have their staff of municipal doctors?" he replied, "Certainly. We have now Sanitary Inspectors—a few, at least—whose duty it is to visit houses even when not invited. They look after the sanitary fittings, the dust-bins, and such like. The municipal doctors in the future will, in the same way, have sections of the city under their charge to look after the health of the people. The citizens of the future will be surprised to know that doctors were once paid for their services by private people, and not engaged by the community. They will also think it funny that doctors were only sent for after people were ill, or when disease had broken out. It will be the business of the new-century Medical Officer to visit people when he is not invited, to do his best to keep those under his charge from falling ill. He can draw from the municipal dispensary whatever he wants, and send people for change of air to the municipal convalescent homes at Margate or Brighton. The health of the individual will become a matter of communal concern." A few years ago, when Edward Bellamy said much the same thing, it was denounced as foolishness, and merely visionary. Matters have certainly advanced since then, but we are bound to confess that such a culmination as is indicated by Mr. Donald is by no means within the region of practical politics.

Bacteriological Research at the Cape.

Dr. Alexander Edington, Director of the Colonial Bacteriological Institute, Cape Colony, who is on a visit to this country, has recently furnished some interesting reports on the work which the Institute has achieved during the last few years. The Institute is supported solely by the Colonial Governments, though it has also received some aid from the Orange Free State and the Transvaal. It has done much good work in investigating the diseases to which South Africa is specially subject, both in man and in animals. The disease which has attracted most attention is horse-sickness, for the ravages of this disease have been terrible. In Cape Colony, for example, during the last outbreak 40,000 horses died in three months; and in Rhodesia and the low-lying parts of the Transvaal, where it appears to be endemic,

and of annual recurrence—its appearance being usually coincident with the malarial season in man—it is so severe that the annual mortality among horses and mules is over 90 per cent. The investigations of the Institute — the results of which we have not space at present to recapitulate in detail—have led to the adoption of certain methods of inoculation, which it is believed will in large measure remove the danger from these terrible ravages from which the Colonies have suffered in past years. It is of interest to note that during the war, though the horses of the British army passed through the affected areas, scarcely any horse-sickness occurred, which is attributed to the fact that it is connected with moist meteorological conditions, and that for some years South Africa has passed through an exceptional cycle of drought. The Institute has also conducted researches during the last ten years with hydrophobia—which first appeared in Cape Colony in 1893—and various diseases incident to cattle, with regard to all of which inoculation has proved very successful. Speaking on the subject of enteric fever, which has been such a scourge to our troops during the war, Dr. Edington stated that it was in nowise a result of the war, but was endemic to South Africa. It had been a scourge for years, and the troops marching through districts in which it lurked were seized by it. Horse sickness in animals and malarial fever in man had, he stated, constituted the great foes to the advance of civilisation in South Africa; but through the progress of preventive medicine it was hoped that the valuable hinterland would soon be rendered habitable for man and beast. The resources of the Bacteriological Institute are at present limited, but it is hoped that the Imperial Government may see its way, in connection with the settlement of South Africa, to take it over and equip it in a first-class manner, so as to increase its sphere of usefulness, and facilitate its investigations into the means of preventing disease both among the white and the black populations. The value of such an agency in promoting the civilisation of the vast territories to be brought under British rule can hardly be over-estimated.

A Tragic Experiment.

The Philadelphia *Medical Record* contains a report of certain experiments conducted by a board of surgeons of the United States army into the transmissibility of yellow fever by means of the mosquito. That mischievous insect has already been convicted of the responsibility for the transmission of malaria to the human race, and the prevalence of yellow fever among the American soldiers in Cuba led the medical authorities at Washington to suspect his responsibility for that disease also, and they accordingly appointed this Commission of investigation. Several of the doctors suffered themselves to be bitten by mosquitoes which had previously been in contact with yellow-fever patients. In one case the daring experiment was attended by fatal results. Dr. Jesse W. Lazear—after one attempt which was followed by no appreciable effects—while visiting a yellow-fever hospital on 18th September, permitted himself to be bitten by a mosquito on the back of the hand. Five days later he had a chill, after three more days jaundice appeared, and on 25th September this heroic martyr to science died of yellow fever. Dr. James Carrol, another member of the board, and a civilian volunteer, had similar experiences, though happily unattended with fatal results. It was considered to have been proved that the disease was contracted not from patients, but from the mosquito bite. From these and other cases the Board have arrived at the conclusion that "the mosquito serves as the intermediate host for the parasite of yellow fever, and it is highly probable that the disease is only propagated through the bite of this insect." This result, which is quite in line with the conclusions regarding the connection of the mosquito with malarial fever, is an extremely important one to have established, but it is sad to think that it should have been reached through the sacrifice of a valuable life.

When Doctors Differ.

A peculiar case occurred at the Sheriff Court of Linlithgow last week, which furnished a remarkable illustration of the old adage, "When doctors differ," and at the same time revealed what appears to be a defect in the Food and Drugs Acts. A dairyman was charged with selling milk from which there had been removed at least 41 per cent. of the natural fat, the analysis showing this deficiency being that of Dr. Macadam, Public Analyst for the County of Linlithgow. But Dr. Hunter, Public Analyst for the County of Midlothian, who was called as a witness for the defence, submitted a totally different analysis made by him of one of the parts of the milk sold to the Inspector. He stated that the milk contained more fat than would meet the highest standard employed by Public Analysts, and he was distinctly of opinion that the statement that "it had been deprived of at least 41 per cent. of natural fat" was absolutely without foundation. The defender's solicitor, in asking for a verdict, referred to the question of expenses, which was a serious one. While it was incompetent, he said, for his lordship to award expenses to the defendant, he thought it right to bring under his notice that the person accused and innocent could only vindicate his innocence and clear his reputation at a cost of from £15 to £20; and he submitted that it was nothing short of scandalous that any dairyman should be involved in such expense without having any relief therefrom in the event of his being successful. The Sheriff, in giving judgment, said it was impossible for him to convict. Clearly a mistake had been made somewhere. Were he to give a verdict of not guilty, it would be tantamount to finding that Dr. Macadam had made a mistake, and a verdict of guilty would be equivalent to holding that Dr. Hunter had made a mistake. As for the question of the expense, he threw out the suggestion that it would be fitting that the Local Authority should bear the expense,

and he was certain that the ratepayers would approve of such a course. We do not know whether such a course would be strictly legal, as there are very strict limitations on the expenditure of public moneys, but there is no doubt that it would be in accordance with equity.

Sewage Disposal in Glasgow.

The Corporation of Glasgow has decided definitely against the adoption of bacterial methods of treatment of the city sewage. At a recent meeting the City Engineer submitted an elaborate report, with figures showing the estimated cost, both capital and annual, the conclusion being that the cost made the bacterial methods prohibitive. Consequently it was resolved that the system of chemical precipitation, which has been in operation at Dalmarnock for a good many years with much acceptance and success, should be adhered to in the new and larger works now in progress at Dalmuir. Dr. Carswell at a later meeting strongly urged that the question should be sent back to the Sewage Committee for further consideration, but in this he received scanty support. It was admitted that the bacterial method was suitable for small communities, but it was maintained that it was utterly inadequate for dealing with such a volume of sewage as that of Glasgow, amounting to sixty millions of gallons a day. We are at a loss to understand that argument when the sewage of a city like Manchester can be successfully dealt with on this system, and when there is good reason to believe that it will ultimately be applied to the stupendous problem of the sewage of London.

Public Works.

SEWERAGE.

The London County Council has agreed to lend the Battersea Borough Council £3395 for sewer and paving works.

The Heywood Town Council is about to spend £8600 in the drainage of the Heap Bridge District of the borough.

The Sherborne Urban District Council has under discussion proposals for the sewerage of the district, and for the disposal of the sewage on the septic system.

The Orsett Rural District Council has entered into a provisional agreement for the purchase of an acre of land for £300 for a pumping station for the draining of Stanford-le-Hope.

The plans prepared by Mr. T. B. Simmons, Sanitary Inspector to the Sherborne Urban District Council, for the reconstruction of the drainage system at the Sherborne Union Workhouse have been approved and sanctioned by the Local Government Board. The scheme includes, for the efficient flushing of the drains, the fixing of two automatic flushing tanks, one at the head of each of the main branch drains. The Sherborne Board of Guardians have further instructed him to prepare a specification of work required to be done in the construction of two inspection chambers, a ventilating shaft, and fixing an automatic flushing tank in connection with the drains from the isolation hospital at the workhouse.

The Rural District Council of Eastbourne has decided to undertake the sewering of Willingdon village.

At a recent meeting of the Devizes Urban District Council the chairman read Messrs. Dibdin and Thudichum's report upon the adaption of the sewage works to their system of sewage disposal. After some discussion it was resolved that as the estimate of cost included in one sum the addition to the cost of the filter beds, and the cost of a road all round the works, the necessity for which was not absolute, the Town Clerk be directed to write to Messrs. Dibdin and Thudichum, and inquire what sum they had allowed in their estimate for making the road, and that after their reply is received a meeting of the whole Council in Committee be called, which the County Medical Officer be invited to attend, when the merits and costs of the two schemes will be finally considered. It was also resolved to recommend the Council to sanction application being made to Messrs. Cameron and Co., to give an estimate for a second filter bed (an additional fee to be paid them if required), and that they be asked to state what amount was allowed in their estimate for the alternative gear provided for, which might possibly be dispensed with.

There has been presented to the Glasgow Corporation a memorandum by the City Engineer regarding the proposed sewage works at Dalmuir, setting forth the present position of the work, and embodying as far as possible the results of the bacteriological experiments at Dalmarnock, with the view of ascertaining to what extent bacterial methods are capable of application at Dalmuir, and, so far as possible, the relative costs of the system already adopted by the Corporation, and of the works necessary for bacterial treatment of sewage. The memorandum in its course states that the estimated cost of the various works required for the bacterial treatment of sewage at Dalmuir would stand:—Tanks, £220,000; bacteria beds, £1,330,000; pumps, £10,000. In addition, the extent of the lands belonging to the Corporation between the line of the Lanarkshire and Dumbartonshire Railway and the river, available for sewage works, is 100 acres, so that the capital sum of £1,560,000 would be increased by the cost of 30 acres of additional land required to provide room for the tanks and bacteria beds, railway sidings, roads, and other means of communication.

At the last meeting the Moffat Burgh Commissioners came to a final decision regarding a site for the proposed works in connection with the burgh sewage purification scheme—a question which, so far as the plans and site are concerned, has been a perennial topic of discussion for several years past. A letter was submitted from Messrs. Hope, Tod, and Kirk, W.S., Edinburgh, agents for Mr. J. J. Hope Johnstone of Annandale, in reply to an offer made by the Commissioners to purchase a portion of the meadow on the Ker lands lying between Old Carlisle-road and the river Annan, and extending to 1¼ acre, for a site for the proposed works. The communication stated that the proprietor was unwilling to sell the land outright, but was willing to feu the portion. The meeting unanimously agreed to feu the ground on the terms previously offered, viz., £8 per acre, with £5 per annum for way leave. The Clerk was instructed to publish the notices required by statute, and to ask the engineer (Mr. T. O. Niven, C.E., Glasgow) to prepare a plan for the inspection of the ratepayers, and to proceed with the works when the period of notice had elapsed. The scheme, which was adopted in May, 1898, and which has been delayed owing to the difficulty in securing suitable land, was one of three alternative systems reported upon by Mr. Niven, and is known as Mr. Dibdin's or the Sutton system for the biological treatment of sewage. The estimated cost of the scheme, exclusive of land and way leave, is £2200. There are no patent rights nor royalties connected with the system, and the cost of working and maintenance is reckoned at about £100 per annum.

An inquiry has been held at Portslade with reference to an application of the Portslade and Southwick Outfall Sewerage Board for powers to borrow £3700 for completing the joint sewerage scheme.

The Chipping Norton Town Council has received a letter from Exeter *re* the covering for the septic tank at the new sewerage works, and the company at that city strongly advised the Council for various reasons to adopt the closed or covered-in style of tank.

WATER.

The inhabitants of Birkdale have given their final adhesion to the Water Board Bill.

The Branston Rural District Council has resolved to take in hand the water supply of Potter, Hanworth.

We understand that Cheslyn Hay, in the Cannock Rural District, is to be provided with a public water supply at a cost of about £5000.

The Cockermouth Rural District Council has decided to spend £3200 in works of water supply for Gilcrux and Croscannonby, and £400 in drainage works for Dovenby parish.

The new Scone water supply was formally turned on in front of the Public Hall, Scone, last week. The opening ceremony was performed by the Hon. A. D. Murray, County Councillor for the village.

It is understood that the Rattray Police Commission has decided to ask Blairgowrie Water Commission whether it could supply the whole burgh (including Westfield) with water, and, if so, on what terms.

At a recent meeting of the Cheddar District Council, at Axbridge, a resolution instructing Mr. A. Powell, C.E., to prepare a scheme for supplying the parish of Cheddar with a pure and adequate supply of water was adopted.

Last week the South Darley Council held one of the most important meetings of its history, when it was decided to apply to the Local Government Board for power to furnish the whole of the extensive district with a good and wholesome supply of water.

The Corporation of Irvine seeks powers to introduce an additional water supply for the burgh, and to construct and maintain works, and to widen and improve a street. Powers are sought to use the water of the Caaf Water and Broadshaw Burn, and compensation water is allowed, amounting to 373 gallons per day for every acre of the surface area draining into the reservoir. The borrowing powers extend to £120,000 for the waterworks, and £5000 for the street improvement.

The Borough of Wolverhampton is about to considerably extend and improve its water supply, means of storage, and powers of distribution. The scheme has been prepared by Mr. Horatio Brevitt (Town Clerk). The Corporation will obtain its powers from a legal document which may be cited as the Wolverhampton Corporation Water Act, 1901, with which are incorporated certain other Acts affecting the question of water supply. This Bill it is proposed to promote during the course of the next Parliamentary session.

Promoters of the scheme for bringing down the Aldfield sulphur water to Ripon have not abandoned hope of carrying it into effect, a clause for that purpose having been inserted in the Corporation Bill, 1901, with a view to testing the feeling of the ratepayers. At a recent meeting the City Council discussed the advisability of issuing to the ratepayers the whole of the medical reports and details of the scheme prior to the meeting this month, at which a poll is sure to be demanded by one side or the other. It was agreed that this should be done, and a Committee, including those for and against the scheme, was appointed to draw up the report.

A Local Government Board inquiry has been held at Sevenoaks by Mr. H. H. North, with reference to the application of the Urban District Council for sanction to borrow £3000 for the purpose of dealing with the Bradbourne storm water, rendered necessary by the injunction granted by Mr. Justice Bruce in the case of Lambarde *v.* the Council.

Messrs. John Tubnbull, Jura, and Sons, consulting and hydraulic engineers, Glasgow and London, have signed a contract for the largest water power installation that has ever been established in Ireland. It is for a flax mill on the river Mourne, and includes the complete outfit for 1100 horse-power on a 16ft. fall. This power will be developed from five improved Hercules turbines placed vertically in steel cases, and transmitting their power to one line of horizontal shafting.

A public meeting was held at Rugby recently with reference to the Urban District Council's Bill for constructing additional waterworks for the supply of its district. In moving a resolution giving the necessary consent, Mr. Eden dealt with the history of the town's water supply, and said the demands of the mill owners and riparian proprietors rendered it necessary that further parliamentary powers should be obtained. At present the Council had power to take 400,000 gallons a day. The Council had purchased Brownsover Mill and land adjoining, and the suggested Bill would give power to spend £140,000 if necessary on the matter. The proposal met with strong opposition from four former members of the Council. Mr. Parnell thought a great deal of money was being spent unnecessarily. The town would get as much water as was needed for many years to come from the river Avon without going to Showell to construct a reservoir. Mr. Seabroke argued that the present population of the town should not be heavily taxed for the benefit of the future generations. The meeting was very protracted, and ultimately a proposal was made that it should be adjourned. This was put to the meeting, and negatived by 40 votes to 35, and the original motion was carried by 46 to 29. Mr. Parnell then demanded a poll of the town.

LIGHTING.

The new electric lighting scheme at Stockton, estimated to have cost £26,500, has been completed.

The London County Council has agreed to lend the Battersea Borough Council £20,000 for electric lighting purposes.

The London County Council has decided to lend the Woolwich Borough Council £20,000 for electric lighting and dust destructor works.

Messrs. Dick, Kerr, and Co., Limited, Kilmarnock, are to supply steel work and electric plant which the Portsmouth Corporation require. The contract price is £202,409 6s. 4d.

The Devonport Town Council have decided to authorise the promotion of a Bill in Parliament to acquire the gasworks undertaking. A meeting of owners and ratepayers will now have to be held and a second meeting of the Council before the final step is taken.

To meet the increasing demand for the supply of gas in Hull, the British Gas Light Company, Limited, have deposited a Bill for powers to enlarge their gasworks by the acquisition of over twenty acres of land adjoining their existing works at Sculcoates. For the purposes of exercising the powers sought under this Bill, and for the general purposes of their Hull Station undertaking, Parliament is asked to sanction the creation of £280,000 further capital, of which £210,000 is to be raised as 5 per cent. capital, and £70,000 by borrowing on mortgage at 4 per cent.

THE Edmonton District Council is meeting with some opposition to its proposal to join with surrounding districts in promoting a Bill to generate and supply electricity. A memorial, containing some 500 signatures, has been received against the scheme, and another is being extensively signed.

AT a recent meeting of the Long Eaton Urban District Council, the Council's Electrical Engineer submitted plans and specifications for an electric lighting scheme for the town, and it was decided to send the same to the Board of Trade for approval. It was also resolved to apply to the Local Government Board for sanction to borrow £15,000 for carrying out the scheme.

THE Finance Committee of the Bradford City Council has just drawn cheques to the value altogether of about £168,000 in connection with the purchase of the undertaking of the North Bierley Gas Company. The shareholders are being paid out individually, and between 400 and 500 cheques have been drawn. The largest holding amounted to about £4000 or £5000. The purchase cannot be completed until early in January.

NOTWITHSTANDING the strenuous opposition of two-thirds of the ratepayers of Sleaford to the electric lighting scheme, organised by a majority of the Urban District Council, the Local Government Board have followed the granting of a provisional order by sanctioning a loan of £7000 to carry out the project. The only restriction made is that the money shall be repaid in twenty-five years, instead of thirty. As only a two-wire system is to be used, it is urged by experts that should the town continue to increase as at present, larger works and the three-wire system will have to be substituted, thereby greatly adding to the outlay. The action of the Local Government Board in thus placing an unnecessary burden upon the ratepayers has given rise to great indignation on the part of the large ratepayers.

THE provost, magistrates, and councillors of the burgh of Ardrossan are seeking authority to erect, construct, and maintain new gasworks, and to construct and maintain additional waterworks, and for other purposes. The clauses dealing with the gasworks define the limits of the Provisional Order sought for to compromise and include the burgh of Ardrossan, the suburbs thereof, and places adjacent (excluding the burgh of Saltcoats) within the parish of Ardrossan. Clause 9 gives power for local authorities to purchase portions of the undertaking within their district. The illuminating power of the gas supplied by the Town Council shall not be less than sixteen candles. The powers for the erection of new waterworks are limited to a period of seven years. The borrowing powers for the gasworks do not exceed £40,000, and for the waterworks £60,000.

A BILL has been deposited in the Private Bill Office of the House of Commons to incorporate and confer powers on a company to be known as the Derbyshire and Nottinghamshire Electric Power Company. The company is to be established for the purpose of "producing and supplying electrical energy" within the whole of the county of Nottingham and the county of Derby, except that part of Derbyshire which lies to the south of the river Trent and to the north-west of the boundary between the unions of Bakewell and Chapel-en-le-Frith. The share and loan capital of the proposed company is fixed at £2,400,000, of which £600,000 may be raised by the issue of debenture stock, and £1,800,000 by the issue of £1 shares, but with the right to divide these shares into "preferred half-shares" and "deferred half-shares." The company ask for powers to proceed to acquire the lands authorised to be taken under this Bill as soon as £100,000 "of the capital of the company shall have been subscribed under contract binding the parties."

A BILL has been deposited for next session to incorporate a company under the name of "The Electric Power (Yorkshire) Company," for the purpose of supplying electricity "to authorised undertakers and to persons requiring a supply for power." The area of the proposed company's operations, as described in the Bill, is to comprise "that portion of the West Riding of the county of York which lies to the southward of a line drawn along the southern bank of the river Ouse from its mouth to the junction therewith of the river Wharfe, thence proceeding along the southern bank of the river Wharfe to the bridge over that river known as "Bolton Bridge," thence westwardly along the main road past Bolton Bridge Village, the "Devonshire Arms," Hambleton-cottages, Long Causeway and New Lathe to the bridge over the Skipton and Ilkley branch of the Midland Railway between New Lathe and Skibeden, thence along the Skipton and Ilkley Railway to its junction with the Shipley and Colne extension of the Midland Railway, and thence along the Shipley and Colne Extension Railway to the point at which that railway crosses the boundary between the counties of York and Lancaster. The share and loan capital proposed to be authorised by the Bill is £2,666,666, of which sum £666,666 may be raised by the issue of debentures, and £2,000,000 by the issue of £10 shares, with the right to divide the shares into "preferred half-shares" and "deferred half-shares." The company is not to put in force the powers contained in this Bill until £100,000 of the share capital shall have been subscribed.

GENERAL.

THE Bristol Corporation has resolved to construct an underground sanitary convenience in Old Market-street.

MR. W. F. H. CREBER has been appointed Engineering Assistant to the Derwent Valley Water Board, at a salary of £250 per annum.

THE Highways Committee of the London County Council has resolved to appoint an electrical engineer at a salary of £1000 a year, to deal with the reconstruction for electrical traction of the Council's tramways.

APPLICATION is to be made to the Local Government Board for a Provisional Order for the formation of the urban district of Grays and the rural district of Orsett into a united district, for the purpose of providing a joint hospital for infectious cases.

THE Edmonton District Council has passed a formal resolution to apply to the Local Government Board for sanction to a loan of £10,000 for the purchase of land at Hertford-road, for the erection of an infectious hospital, and also a small loan of £150 to cover the cost of conveyance, &c.

A LOCAL Government Board inquiry was held at the offices of the Bromley and Beckenham Joint Hospital Board recently, into an application by the Board for sanction to borrow the sum of £6500 for the erection of new diphtheria wards at the Infectious Diseases Hospital, Bromley Common.

THE Torquay Town Council has decided to offer to supply Teignmouth with a minimum of 15,000,000 gallons and a maximum of 25,000,000 gallons of water per annum, delivered by meter at the point of junction with the Corporation's main at or near Teignbridge, into a 7in. main to be laid by the District Council, thence to Teignmouth, for a period of fifteen years, at a charge of 1s. 1d. per 1000 gallons, meter rent £5 per annum, provided that the quantity supplied in any one day shall not exceed 200,000 gallons; and that this offer be open for acceptance within one month. In the event of the offer being accepted, the necessary steps will be taken to obtain power to raise the dam of the Kenwick reservoir at an estimated cost of £12,000.

A Local Government Board inquiry has been held at Queensbury with reference to the application of the District Council for sanction to borrow £2970 for main road and street improvements.

The Chesterfield Town Council has received sanction for promoting a street improvement Bill. The cost involved in the scheme amounts, it is estimated, to £177,000, and two new streets are contemplated, one being from Low Pavement to Holywell Cross, and the other from Gluman Gate to Sheffield-road.

A town's meeting at Portsmouth last week decided to celebrate the commencement of the new century by promoting a fund for the establishment of a sanatorium for consumptives on the southern slope of Portsdown-hill, overlooking Portsmouth. It is proposed to ask the Government, which owns the hill, for a site, and as the War-office contemplates building a large military hospital for the garrison in the vicinity, hopes are entertained that the answer will be favourable.

There was laid before a recent meeting of the East District Committee of the Berwickshire County Council at Ayton, a report by the County Sanitary Inspector on an outbreak of small-pox in the district. In October a woman, employed as a rag cutter in Chirnside-bridge Paper Mill, was certified to be suffering from small-pox, and was at once removed to the District Hospital for Infectious Diseases. A few days later the wife and child of a workman in the same department of the mill were also certified to be suffering from small-pox, and immediately after the husband himself became ill. The whole family was removed to the hospital. A young lad at Preston, about four miles distant from Chirnside, who had visited at the house of the latter family, was next laid down, and he too was speedily removed to the hospital. Here the nurse and caretaker were next seized, and in all there were nine small-pox patients under the care of the Medical Officer. The caretaker and one child died, while the other seven patients recovered. There has been no case since in the district. A question having arisen as to how the hospital is to be disinfected, the opinion of the Local Government Board is to be taken before the work is entered upon.

FORTHCOMING MEETINGS.

January.

Saturday, 5th.—Sanitary Inspectors' Association.—President's New Year's address.

Saturday, 12th.—Metropolitan Asylums Board resumes.

Monday, 14th.—Surveyors' Institution.—Ordinary general meeting. Adjourned discussion on "The Future of the London Water Supply," by Mr. R. E. Middleton. 8 p.m.

Tuesday, 15th.—Sanitary Inspectors' Examination Board.—Examination for Sanitary Inspectors, St. Stephen's House, Victoria Embankment.

Monday, 21st.—Surveyors' Institution.—Junior meeting. Mr. L. S. Wood on "Income Tax, Schedule A." 7 p.m.

Tuesday, 22nd.—London County Council resumes.

Thursday, 24th.—Society of Architects.—Sessional meeting. 8 p.m.

Dr. John Shepherd has been reappointed Medical Officer of Health for North Walsham, at a salary of £20 per annum.

Change of Address.—Mr. F. Redman, Civil Engineer, has removed from the Railway Offices, Newport-street, Swindon, Wilts, to more central premises at 34, Wood-street, Swindon.

Subject to the approval of the Local Government Board, Mr. J. H. Pearson, of Minster, near Ramsgate, has been appointed Inspector of Nuisances for the urban district of Broadstairs, at a salary of £100 per annum.

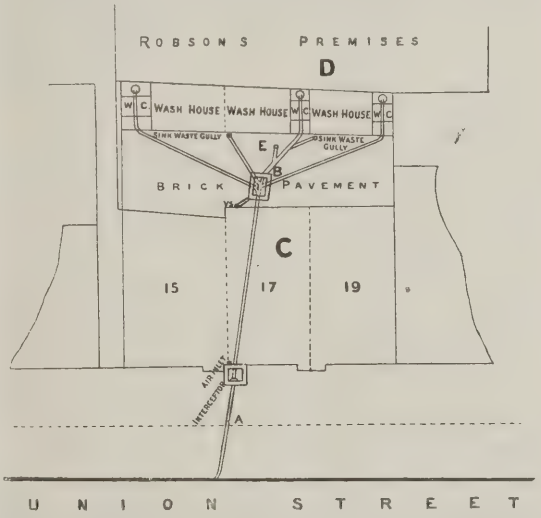
NOTES AND QUERIES.

Subscribers may obtain advice on matters appertaining to Public Health Law and Municipal and Sanitary Engineering. Letters should be addressed "Notes and Queries," The Sanitary Record, 5, Fetter-lane, London, E.C. If an answer be required immediately, a stamped addressed envelope must be enclosed

2055.—Hygiene: Teaching of, for Ladies.—"B. B." writes:—"I have obtained a first-class certificate from the Science and Art Department both in elementary physiology and in hygiene, and am now studying in the advanced stages for these two subjects. Will you please advise me (1) whether I ought to study any other subjects to qualify as a lecturer in hygiene? (2) If I obtained a pass in the honours stage, would that qualify me as a lecturer, or must I go through a course at the Ladies' Sanitary Association? If I qualify by examination as a lecturer, should I be able to obtain an appointment?"

Answer.—(1) If the candidate obtains a first-class certificate in the advanced stage in hygiene, she will be enabled to teach hygiene in classes in connection with the Science and Art Department. (2) If she obtains a certificate as a teacher under the National Health Society, she will be enabled to teach and lecture on the laws of health in classes, &c., in provincial towns and villages, and the Society will endeavour to secure engagements for her. For full information, however, she is advised to write to the Secretary, National Health Society, 53, Berners-street, Oxford-street, London, W.

2056.—Drain or Sewer: Premises within Same Curtilage.—"A. S. J." writes:—"My Council recently caused notices to be served on two separate owners to reconstruct defective drains on premises shown on plan, and marked C and D. At the time of service D.'s drainage was connected with C.'s system, and carried to the main sewer by the pipe A B. On receipt of his notice D. disconnected his drainage from C.'s system, and took his drain direct to the main sewer through his own property. My Council, therefore, served a new notice on C. to remove the defective drains and construct new ones as shown on plan. C. now declines to obey this notice, contending that the drain A B is a sewer, as since the disconnection of C.'s drainage it only



receives the drains of houses which are the property of one owner. You will notice that the premises of C. are enclosed by a high wall, the only entrance to the houses being by the front doors. Each house has a separate wash-house and w.c.; the yard at rear has no divisions. My Council carried out the work, and have demanded payment from C., who declines to pay. Will you kindly advise as follows:—(1) Whether under the circumstances you consider my Council can recover, and whether the drain A to B became a sewer immediately the drainage of D.'s property was disconnected? (2) Are the premises within the same curtilage?"

Answer.—(1 and 2) The Council should be able to recover the cost of executing the work in question, as the construction, in our opinion, is a drain and not a sewer, as the cottages are within the same curtilage—see Pilbrow *v.* St. Leonard's, Shoreditch (1895) 1 Q.B. 433; 59 J.P., 68; St. Martin's-in-the-Fields *v.* Bird (1895) 1 Q.B. 428. The duty to repair the drain is on the owners.

2057.—Inspectors of Weights and Measures: Books Required.—"J. J. G." writes:—"Would you be good enough

to inform me if there are any books published which will help me to qualify for an Inspector of Weights and Measures?"

Answer.—The following books will, we believe, be found useful: "Model Regulations with respect to Inspectors and the Inspection of Weights and Measures, and Weighing and Measuring Instruments," price 1s. 6d.; and "Examinations of Inspectors of Weights and Measures—Notice to Candidates and Heads of Examinations," price 2d.; Jamieson's "Elementary Manual of Applied Mechanics," price 3s. 6d.; and Balfour Stewart's "Lessons in Elementary Physics," price 4s. 6d. Any of the books may be obtained post free at the prices named from the office of this journal.

2058.—SANITARY INSPECTORS: QUALIFICATIONS. — "Old Reader" writes: "Please inform me what qualifications are necessary to become a Sanitary Inspector. Kindly also state whether a candidate has to pay any fees when sitting for an examination."

Answer.—We regret we are unable, for reasons of space, to describe what qualifications are essential in a person intending to become a Sanitary Inspector. The querist is, however, advised to procure Taylor's "Sanitary Inspector's Handbook," price 5s., wherein all the information sought by him will be found fully detailed. The book may be obtained post free from the office of this journal at the price named. The fees for candidates for the certificate of the Sanitary Institute are £4 4s., when the examination is held in a provincial town.

2059.—DELEGATION OF POWERS TO COMMITTEES OF DISTRICT COUNCILS.—"J. P. H." writes:—"Has an Urban District Council power under the Public Health Act to pass a resolution giving general powers to their Sanitary Committee to instruct their Inspectors to issue notices and take legal proceedings for the abatement of nuisances—in short, to delegate the whole of the nuisance clauses to the Sanitary Committee to deal with, without confirmation in each case by the whole Council?"

Answer.—This district is that of a Municipal Corporation, and Sec. 22 (2) of the Municipal Corporations' Act, 1882, applies. The section referred to empowers the Council to appoint out of their own number such and so many committees either of a general or special nature, and consisting of such number of persons as they think fit for any purposes which, in the opinion of the Council, would be regulated and managed by means of such Committees, but the acts of every such Committee shall be submitted to the Council for their approval. It is, however, apprehended that when the Council is acting under the Public Health Acts, and the Elementary Education Acts, such ratification is not necessary. (See Arnold's "Law relating to Municipal Corporations.") In the case of Parish, Urban, and Rural District Councils, similar powers of appointment of Committees are given under Sec. 56 of the Local Government Act, 1894, and this section enacts that "where a Committee is appointed by any District Council for any of the purposes of the Public Health Acts, or Highway Acts, the Council may authorise the Committee to institute any proceeding, or do any act which the Council might have instituted or done for that purpose other than the raising of any loan, or the making of any rate or contract." Under this section no subsequent confirmation by the District Council is required to the Acts of Committees except as specified. It therefore follows that if any one of the Councils named, *i.e.*, Borough, Urban, Rural, or Parish Councils, have delegated the full powers, as they are entitled by the Act, the Committee may institute legal proceedings in such cases as that named, and any minutes relating thereto do not require ratification.

2060.—SALE OF FOOD AND DRUGS ACTS: SANITARY INSPECTOR MAY TAKE SAMPLES.—"A. D. S." writes:—"I am an Inspector of Nuisances under an Urban District Council, and appointed with the approval of the Local Government Board. At the time of my appointment I was instructed to take samples of food, &c., under the Sale of Food and Drugs Acts, when and as I thought necessary. It is now considered by some persons that I have no power to act in that capacity. Samples of food, &c., are taken in this district for the County Council by the Inspector of Weights and Measures. Kindly let me have your opinion on the matter, having regard to Sec. 13 of the Sale of Food and Drugs Act, 1875, and Sec. 8 of the Local Government Board's Order of March, 1891. (2) Is any special procedure necessary for the appointment of an analyst? (3) Must the analyst for the district be the County Analyst; and (4) should the result of the analysis be set out in the form set forth in the schedule of the Sale of Food and Drugs Act, 1875? (5) Does any special power exist for any Inspector to take samples of milk, water, or other article of food for the purpose of ascertaining the source of infectious disease?"

Answer.—(1) An Inspector of Nuisances who is appointed subject to the approval of the Local Government Board, has his

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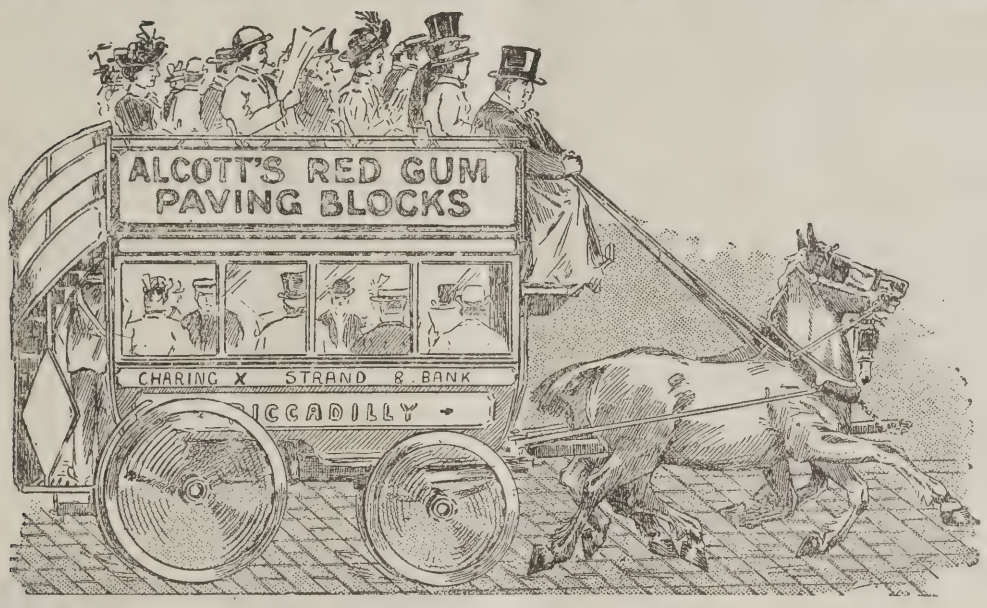

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duties defined by the regulations contained in the Board's General Order of the 23rd March, 1891. Clause 8 of this Order prescribes that "the Inspector shall when and as directed by the Sanitary Authority, procure and submit samples of food, drink, or drugs suspected to be adulterated, to be analysed by the analyst appointed under 'The Sale of Food and Drugs Act, 1875,' and upon receiving a certificate stating that the articles of food, drink, or drugs are adulterated, cause a complaint to be made, and take the other proceedings prescribed by that Act." When, therefore, an Inspector has been generally or specially directed by a Sanitary Authority to take samples of food, &c., for analysis, no special resolution appointing him Food and Drugs Inspector is requisite, as he is already such by virtue of his appointment as Inspector of Nuisances. Sec. 13 of the Sale of Food and Drugs Act, 1875, also empowers an Inspector of Nuisances acting under the directions of the Local Authority, to procure samples of food. (2) No. Except in the case of boroughs having a population exceeding 10,000, and County Councils who have to appoint separate analysts. (3) Yes. Except in boroughs having a population exceeding 10,000. (4) Yes. (5) No. The provisions of Sec. 116 of the Public Health Act, 1875, and of Sec. 4 of the Infectious Disease (Prevention) Act, 1890, should not, however, be overlooked.

2061.—Medical Officer of Health: Residence in District.—"A Subscriber" writes:—"I shall be glad if you can point out any clause in a public Act or in a Local Government Order bearing upon the question of the residence within the district of the Medical Officer of Health or Sanitary Inspectors either as the same may refer to London or the provinces. I have been informed there is such a requirement in force, but have not yet been able to find the same."

Answer.—The only statutory provision is contained in the Public Health (London) Act, 1891, Sec. 106 of which provides that "every person appointed or reappointed after the commencement of this Act as Medical Officer of Health of a district shall (except during the two months next after the time of his appointment, or except in cases allowed by the Local Government Board) reside in such district or within one mile of the boundary thereof, and if, while not so residing as required by this enactment, he assumes to act, or receives any remuneration as such Medical Officer of Health, he shall cease to hold the office." There is no General Order of the Local Government Board, so far as we are aware, which prescribes that a Medical Officer of Health or Sanitary Inspector shall reside within his district.

2062.—Parish Constables: Appointment of: Parish Council may Obtain and Pay for Legal Advice.—"Subscriber" writes:—"An Inclosure Award of 1809 states that the Constable of the township annually is to sufficiently cleanse the public drains in the township, the charges and expenses whereof are to be borne by the several proprietors or occupiers upon the said inclosure by a rate to be laid by the Constable according to the Poor Rate of the said township. It seems the rate is to be on all the land in the parish. Please say (1) how should the Constable be appointed; (2) how the expenses of making and collecting the rate should be paid; and (3) if a Parish Council can obtain and pay for legal advice."

Answer.—(1) The Parish Council may appoint under the Parish Constables Act, 1872, one or more Parish Constables for their parish, and may in such resolution fix the amount of salary to be paid him or them. A copy of any such resolution is to be delivered to the Justices of the Petty Sessional Division comprising the parish, who may appoint a Parish Constable or Constables in accordance therewith—see Jenkins's "Law Relating to Parish Councils and the Local Government Act, 1894," price 10s. (2) See answer above. (3) Yes, but this cannot be done without a resolution being first passed by the Parish Council authorising the employment of a solicitor.

2063.—Flushing of Water-closets: Powers of Local Authority.—"C. M." writes:—"My Authority are considering the question of taking the necessary legal steps to compel the owner of a street of dwelling-houses to provide a supply of water in water-closets for flushing purposes, which are at present hand-flushed. I presume proceedings should be taken under Sec. 36 of the Act of 1875 for not providing a sufficient water-closet to each of the said houses. Could you give me any cases as a precedent where, in a similar action, proceedings have been successful?"

Answer.—If the Local Authority have adopted Part 3 of the Public Health Acts Amendment Act, 1890, they are empowered under Sec. 23 of the said Act to frame bye-laws as to the keeping water-closets supplied with sufficient water for flushing, so as to affect buildings already erected as well as to new buildings. Model bye-laws on the subject will be found in Mackenzie and Handford's "Model Bye-laws of the Local Government Board," two vols., price 25s., which should be perused. In the absence of such bye-laws, the Local Authority may proceed under Sec. 36 of the Act of 1875 if they determine, on the report of their Surveyor or Inspector of Nuisances, that the existing water-closets are insufficient. In Sherborne Local Board *v.* Bogle, Q.B.D., 18th March, 1880; 46 J.P., 675, the defendant was the owner of several houses, each of which had a water-closet attached to it. The water-closets had no flushing apparatus, and were flushed by pouring water from pails. The Surveyor of the Local Board having reported that the water-closets were insufficient, the Board gave notice to the defendant to provide sufficient water-closets, and on his failing to do so, executed the necessary works and proceeded to recover the expenses from the defendant. It was held that the Local Authority were entitled to recover the expenses incurred.

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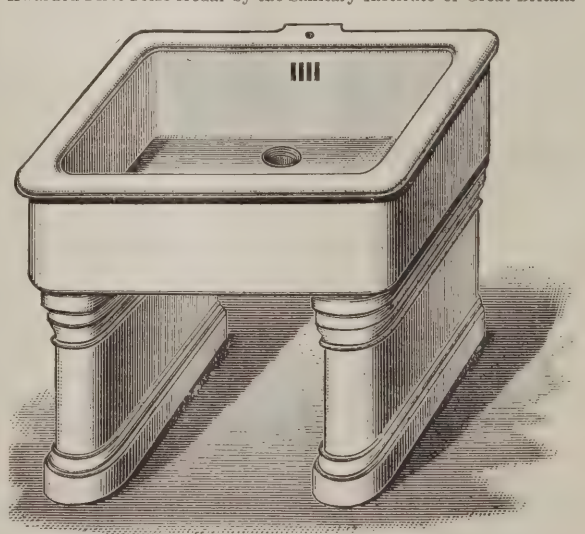

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PUBLIC LIGHTING BY GAS & ELECTRICITY

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Late Chemist and Superintending Gas Examiner to the Metropolitan Board of Works and the London County Council.

(*Continued from page 2.*)

CHAPTER XV.—ELECTRO-MOTORS.

INDUCTION MOTORS.

If we take two semicircular pieces of iron, and by winding insulated copper wire round them in the manner shown in Fig. 25, and passing a current of

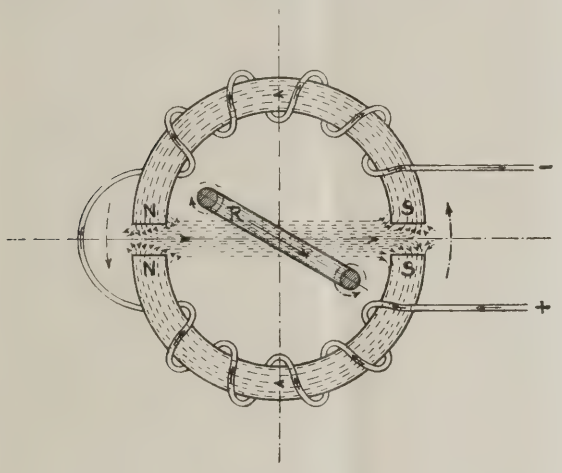

Fig. 25.

electricity through the wire, we produce two electro-magnets, having the two N poles opposite to each other, and likewise the two S poles opposite to each other; and the lines of force will have a tendency to traverse the air space intervening between the two poles, as shown by the dotted lines and arrow heads, thus producing a magnetic field between the two poles.

If we join these two semicircular magnets together the poles still remain the same, and the lines of force will take the same course from one to the other as before, so that the magnetic field remains unaltered.

If we now suspend a ring of copper or other conducting metal R, so that it is free to revolve inside the magnet ring and revolve the latter, so that the lines of force passing from the N to the S poles are cut through by the wire ring, magnetic lines of force will circle round the wire in such a direction that they resist the rotation of the magnet ring, and because the former is free to revolve, the latter drags it round with it and causes it to rotate, but at a slower speed, as otherwise no lines of force would be cut through, and magnetic lines of force would cease to circle round the wire.

This explains briefly the principle on which induction motors are worked, but although in these motors a rotating magnetic field is necessary, the magnets themselves do not rotate, for with two or more alternating currents of different phase a rotating magnetic field can be produced with stationary field magnets.

A three-phase induction motor has field magnets consisting of a laminated iron ring wound with three sets of coils, in the same manner as the armature of the generator shown in Figs. 16 and 18, each set of coils on the motor being connected directly with the corresponding ones on the generator. Fig. 26 shows the armature and field magnets of a motor in position, with the coils of both shown in section, the former, to avoid complicating the description, being shown as if each were wound only once round the core, instead of a great many number of times, as is the case in the actual machines; and the adjoining curves represent the character of the currents flowing through each coil at any moment during one revolution of the armature of the generator.

At a certain moment the current in coil 1, (1) is at its maximum pressure, while in coils (2), 2 and (3), 3 the currents are at half pressure; in coil (2), 2 growing and in coil (3), 3 diminishing. The currents flowing through the coils above the horizontal centre line are momentarily positive, while those flowing through the coils below are momentarily negative, and the lines of force travel through the iron core of the field magnets in the manner shown by the dotted lines and arrowheads, thereby producing a N pole on the left-hand side, and a S pole on the right-hand side.

As the armature of the generator continues to revolve, the currents flowing through the coils alter, so that a moment afterwards it has attained its maximum pressure in coil (2) 2, next moment in coil (3) 3, and after half a revolution in coil 1 (1) again, but reversed; so that those coils which are above the horizontal centre line have now a negative current flowing through them, and those below a positive current. Thus the current attains its maximum positive and negative pressure in each pair of coils, placed diametrically opposite to each other in succession, so that the N and S poles are constantly assuming a different position and travel right round the ring, whereby the magnetic field rotates just as if the magnetic ring itself were being revolved, and with the same speed as the armature of the generator which supplies the current.

The armature consists of a cylindrical laminated iron core, having a spindle on which it revolves, and a number of insulated copper wires or bars arranged on its outer surface, parallel with each other and with the spindle. These wires, or bars, are connected together at both ends on the face of the core by metal rings, or discs, one on

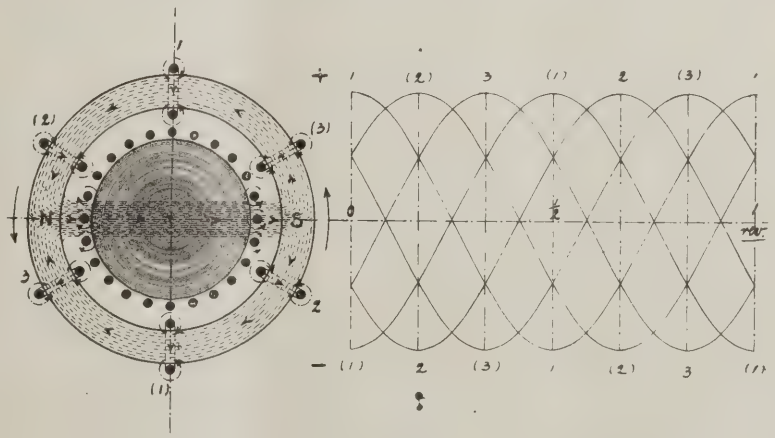

Fig. 26

each side, so that the induced current can flow freely from one wire to another; but they have no connection with the generator whatever, the current flowing through them being generated as the lines of force from the rotating magnetic field are cut through by the wires, thus causing opposing lines of force to circle round them.

Instead of connecting all the wires together so that the induced current can flow uninterruptedly from one to the other, they can be connected in groups to insu-

lated metal rings on the armature spindle, having brushes to collect the current connected with resistances through which the current is compelled to flow, whereby a portion of it is destroyed, and thus less current flows through the wires and fewer lines of force circle round them.

By means of a switch any number of resistances can be switched on, or all can be disconnected, allowing the full current to flow through the wires, whereby the speed of the armature can be regulated, this being especially necessary while starting and stopping with a heavy load, or, in fact, whenever starting and stopping gradually is desirable.

Two-phase induction motors are worked in exactly the same manner, only that two sets of coils are wound on the field magnets instead of three, the current being supplied by a two-phase generator.

Lately induction motors have been made to work with single-phase current, by splitting up the current into two portions, and retarding one portion so that it enters the motor a quarter of a period behind the other, thereby producing a second phase artificially while the motor is being started, and until it has attained its full speed, when it continues working with the single-phase current in its ordinary state, oscillating backwards and forwards between the two portions of the coils placed diametrically opposite to each other. These machines are not nearly so efficient as the two and three-phase, however, and they are liable to stop whenever a heavy load is suddenly put on.

(*To be continued.*)

SEWAGE DISPOSAL IN CALCUTTA.

By A. E. Silk,

Member of the Institute of Civil Engineers, Member of the Sanitary Institute, Sanitary Engineer, Bengal.

(*Continued from page* 4.)

CHAPTER III.—Method of Working.

The action which takes place in a septic tank is brought about by the anaërobic, and the facultative aërobic, microbes which break up the complex substances to be found in sewage into simple chemical compounds, liquid and gaseous. The sewage itself contains all the elements of its own destruction, and all the septic tank has to do is to afford a resting place where the microbes can carry on their work without interruption; this resting place is to be found in the thick mat or felt-like scum which forms on top of the liquid. The particles of organic matter when they first enter the tank sink to the bottom; then a minute bubble of gas forms on each small lump and lifts it up to the surface, where it discharges its bubble of gas and then falls to the bottom again, but probably not without first receiving a few thousand microbes, who will in their attack on the organic particles produce more gas and once more lift it up to the surface to procure more microbes. Owing to the slow current through the tank this up-and-down motion of particles does not take place in the same vertical plane each time, and there is thus a transference of particles in various stages of disruption and demolition from one end of the tank to the other, and it is more than probable that each time a particle of matter rises up to the surface to discharge its bubble of gas, not only does it receive an addition to the number of microbes, but even microbes of a different sort, and consequently the species of microbes that are to be found at one end of the tank are not to be found at the other. Bearing therefore these matters in mind, it leads to the conclusion that a septic tank must be brought into work slowly and by degrees.

A reference has been made to an unsuccessful experiment at Garden Reach; this crude experiment consisted in filling a barrel with night-soil from the mehters' buckets, and then leaving it to stand with the air excluded, as far as possible, for about a fortnight. That some change had taken place in the contents of the barrel was made perfectly evident by the absence of any smell and the change in their colour, but there was no liquefaction of the solids. The mistake that was made, of course, was not providing a collecting ground for the various kinds of microbes, and not providing means by which the particles of organic matter could be brought in contact with the microbes appropriate to the different stages of breaking up from solids into gases and liquids.

The septic tank was therefore first filled with plain water up to what had been fixed to be the normal level, namely, 4ft. 6in. above the floor at the outlet end of the tanks. Sewage was first discharged into the tank on the 22nd April, 1899, and it was kept at work continuously until the 1st May, 1900, or a period of over twelve months and through all seasons of the year. For the first nine months the sewage to be dealt with consisted of one stool mixed with three gallons of water, urine, and a small quantity of washing water, and the latrine was used on an average 220 times a day, so that about 750 gallons per day had to be dealt with. In the middle of January, 1900, the flushing apparatus was disconnected, and only sufficient water was used as would wash the stools out of the pans, and all the washing out was done by hand, so that the minimum quantity of water was used, and the sewage consisted of a mixture of one stool, half a gallon of water, urine, and washing water. Beyond being rather browner in colour, the effluent produced from this extremely strong sewage was to all intents and purposes the same in appearance as that produced from the weaker sewage. At all times there was a very strong evolution of sulphuretted hydrogen gas at the outlet valve, but it was quickly dispersed and was seldom if ever apparent within a distance of three or four yards; possibly, if arrangements were made for drawing off the gases and burning them, the smell at the outlet would be less. The outlet was so regulated that the discharge was continuous day and night, and this caused the minimum amount of disturbance to the contents of the tank: the velocity at the outlet end of the tank was practically constant. It is estimated that the solid fæces discharged into the tank during the year's trial would completely fill it up to the normal liquid level, but on opening up the manhole covers, after the contents had been run out very slowly indeed, only 12·5 cubic feet of sludge was taken out of the tank, equivalent to a depth of nearly 1in. over the whole floor. On testing the thickness of the scum in the grit chamber it was generally found to be about 6in. thick, but at the outlet end of the septic tank there was practically no scum at all. It is therefore, it is submitted, clearly proved that a septic tank has the power of liquefying night-soil in a perfectly satisfactory and inoffensive manner, for practically no sludge was found in the tank after a year's working, and the effluent as it issued from the tank seldom contained more than 13·3 parts per 100,000, or ·013 per cent., of solids in suspension. Samples of the effluent were taken from time to time for record, and although they smelt rather strongly of sulphuretted hydrogen for the first day, with the stoppers kept out of the bottles they quickly freed themselves of gas, and are now as clear, bright, and inoffensive as could be wished.

As this experiment was carried out within the precincts of the Presidency Gaol it was not permissible to introduce outside labour to control the working of the filters, and the *régime* had to be fixed by the hours

* *Vide* Report of the Sanitary Commissioner with the Government of India for 1898, page 277.

during which the prisoners were at work in the garden. It was not considered necessary to purchase automatic gear, for one of the objects of the experiment was to ascertain how far this system of disposal could be attended to by native labour without any special European supervision. From the commencement of the experiment at the end of April until the end of June the effluent was run on to the filters alternately for periods of twelve hours, and although the resulting filtrates appeared to be perfectly satisfactory, as far as appearance was concerned, the chemical analyses of them produced such astounding results* that it became necessary to alter the *régime*. From the end of June the tank effluent was allowed to pass straight through the filters without any period of rest in the filters; but the filters were changed four times a day. In July the effect of double filtration was tried by causing the tank effluent to pass first through two iron gutter pipes filled with furnace slag, and thence to drop down on to the filters; the effect of the double filtration will be shown in the next chapter, but as far as appearance was concerned no distinction could be made between a filtrate from a single cinder bed or that from two slag filters.

A Scott-Moncrieff filter, with its multiple filtration, was also tried; it was found to be a remarkably rapid deodorant, for the septic tank effluent entered it smelling strongly of sulphuretted hydrogen, but left it two minutes afterwards quite free of the gas and inoffensive.

The filtrates were all discharged into the low-level tank in the corner of the gaol garden. When operations were first commenced the tank was covered with a tangled mass of water-creepers, but these were all carefully cleared before the rains set in. During the rainy season the night-soil from the gaol is trenched on the eastern bank of this tank, and there is no doubt that a considerable quantity of polluted liquid from the trenching must have found its way into the tank, and consequently any nuisance that might arise from the tank could not be rightly attributed to the discharge into it of purified filtrates from the septic tank. As a matter of fact the tank has never given the slightest cause for complaint. During the rainy season the surface of the water always appeared clear and fresh, and during the cold and hot weather the surface has become covered with a healthy-looking aquatic plant. There are a large number of fish and water tortoises in the tank, and the favourite basking place of the former is at the foot of the small masonry ladder down which the filtrates are constantly passing.

As was done in the case of the effluent from the septic tank, whenever a sample was taken for chemical examination, a smaller sample was also taken for record; not a single one of these samples has given the slightest offence, and at the time of writing they are quite clear and bright, with a small deposit, probably of bacterial matter, at the bottom of each.

The filtering material that is in use at the present time is that which was originally placed in the filters, and it appears to be as good and as fresh now as ever it was. It was found that when the effluent from the septic tank had been allowed to run for any length of time on one spot, the filtering material got covered with a black sort of slime which looked rather offensive; it was found that all that had to be done was to turn the material over with a spade once or twice, or perhaps stop the filter for twenty-four hours, and the slime would quickly disappear. In the iron gutters fitted with slag, that have been already mentioned, this slime appeared to collect in larger quantities than elsewhere; on drying the contents of these gutters in the sun, this slime was found to consist mostly of fibrous matter, which, when dry, gradually disintegrated and got blown away as dust or washed into the filter, on the top of which the slimy slag had been spread, by the first downpour of rain.

No sewage fungus was ever found at the outlet from the filters. The cinder filters had occasionally to be run dry for a couple of days to kill off the "intestinal worms" which seemed to thrive luxuriantly in the recesses of the filtering material or anywhere else that was exposed to the light. If the filtrates were allowed to stagnate in the filtration wells, they became the breeding grounds of mosquitoes and dragon flies, for their larvæ was found in abundance. Except for these no other forms of life were observed during the experiment—no doubt many others might have been found by microscopical examinations, but it was not considered necessary to have these made.

(To be continued.)

* The analyses for albuminoid ammonia were eventually cancelled by the chemical examiner.

HOW TO CHECK DIPHTHERIA.

An outbreak of diphtheria at Summertown, in Oxfordshire, has recently been engaging the attention of the Local Authorities. As a consequence, a report on the outbreak was submitted to the Sanitary Committee by the Assistant Medical Officer of Health, Dr. Ormerod. The occasion was made the subject of an interesting statement, affecting not only the outbreak in question but such outbreaks in general, by Dr. Colbie, who said that in view of the widespread interest which was taken in this epidemic at Summertown, he should like to say a few words to show how satisfactory the report was, and to show how satisfactorily the Medical Officer of Health for the past few years had dealt with the question of diphtheria. In order to do this, he should like briefly to quote a few figures from the back numbers of their sanitary reports with regard to diphtheria, and to be absolutely fair he would put the bad with the good. During 1890 Mr. Winkfield reported for the first time for twenty years that there had been no death from diphtheria in Oxford. In 1891 the Notification Act came into use, and in that year nine cases of diphtheria in Oxford were reported, with three deaths. He wanted to call attention particularly to the

PERCENTAGE OF DEATHS.

In that year it was approximately 30 per cent. In 1892, instead of nine cases, they got 86, with 23 deaths, a percentage of 26; in 1893 there were 101 cases, with 32 deaths, being a percentage of 31; in 1894 66 cases were notified, resulting in 23 deaths—a percentage of 30; in 1895 there were 80 cases and 14 deaths, which was 18 per cent.; in 1896 46 cases of diphtheria were notified, and only five deaths occurred, which was a drop to 12 per cent.; in 1897 there were 19 cases and two deaths—10 per cent.; in 1898 30 cases were notified and five deaths resulted, which was 16 per cent.; in 1899 91 cases occurred and three deaths took place, which was 4 per cent.; whilst in 1900 131 cases were reported, and only two deaths occurred. This gave them a percentage for the year of only 1½ per cent. He thought it was quite worth while asking themselves for a few minutes how it was they had got this extraordinary lowering in the percentage of the death-rate of diphtheria. He would draw attention to one or two facts. When they had a heavy death-rate for diphtheria it meant that the cases had been severe, and in bad cases of diphtheria persons might be incapacitated for a great number of weeks and even months, and frequently

DIPHTHERIA LEFT BAD EFFECTS,

especially among young children, such as severe forms of paralysis. It was interesting to notice this extraordinary lowering of the percentage of the death-rate,

and how did they account for this? There were two factors, he thought, which were brought into play. He did not believe the notification from 1891 to 1895 at all represented the number of cases which actually existed, and for this reason. About that time medical men in Oxford used to come to their diagnosis of diphtheria by looking at the throat of the patient, and if they found a well-marked membrane they used to call it diphtheria. They knew now that that was by no means conclusive evidence, and that that only occurred in severe cases. They might get a simple form of sore throat, which in old days they would have passed over. They might examine bacteriologically and find the germ of diphtheria present, and he thought that was one reason why they had notified these mild cases, and by notifying them they had prevented epidemics. Another factor he should like to call attention to was that he did think they had been greatly helped by the

ANTITOXIN SERUM.

Cases had been taken early, and were searched more carefully than was the custom in former times, and when they got to the hospital they were taken and inoculated at once. He knew Mr. Winkfield, who had certainly the greatest experience of any man in diphtheria in Oxford, and who had assured him over and over again that since the introduction of the anti-toxin serum his anxiety had been immensely relieved, because he knew the cases would run a more favourable course. In connection with this he should like to say a word or two with regard to the sister University. Curiously enough, they had had a parallel epidemic at Cambridge, and he should like to show the difference in the quiet way in which they had been doing their work. He thought they had to thank Dr. Ormerod for the indefatigable manner in which he had acted in searching out these cases, and also the district nurses. When he noticed they had had an epidemic of diphtheria in Cambridge, he wrote to the Medical Officer of Health to know what they were doing. He told him that in the course of one month he had sent out seven circular letters to different districts, and had got the aid of a body of experts from the Pathological Laboratory of the University. He had received that morning a report from him, because at the

END OF A MONTH THEY KILLED THE EPIDEMIC.

He found in the report that they had sixty-two cases with five deaths, and a portion of it he should like to read to them. They went very thoroughly into the question as to how the epidemic arose, and they came to the same agreement as Dr. Ormerod. This was what they said: "That all other sources of infection may be dismissed from consideration, except that of social intercourse or elsewhere." They go on to say: "This successful check to a diphtheria invasion which might have attained overwhelming force at a season specially favourable to the disease, as shown by the many towns in England and Wales that have been assailed, has been due to the united efforts on the part of all persons concerned, viz., Prof. G. Sims Woodhead, the Professor of Pathology, by his sound and prompt advice; the assistance by his staff, especially Dr. Cobbett; and by the use of his material." He thought they might congratulate themselves just as much as the Cambridge people on having prevented a serious epidemic. There was one reason in this report which he thought Dr. Ormerod might have dwelt with a little greater force upon. He simply mentioned that

SCHOOLS WERE THE FOCUS

from which diphtheria spread. He thought it would have been wise if he had pointed out how this came about, and he proposed to say something on this point. They knew these children came to school at an age at which they were extremely liable to infection where infection was about. They knew also that diphtheria was spread generally from mouth to mouth, that was to say, the germ was in the saliva, that it is not spread through the air to the same extent as scarlet fever or measles. It was a sort of mouth-to-mouth trouble. In schools this was what happened. Among the girls they got a great deal of kissing, and if they watched a number of boys directly they began to play they commenced wrestling with each other, and got their mouths in close contact. Children of that age were great Socialists; they believed in the division of property. There were one of two ways in which teachers should be warned. For instance, there was a sweet called "a black drop," or something of that sort, made up of peppermint, and it had been noticed of children holding these Socialistic views that they passed the sweet round and each had a suck. They could imagine if A had first suck and had diphtheria germs in his mouth that it was quite easy to account for the others getting it. And in another respect

CHILDREN WERE SOCIALISTS.

They believed in the division of property. A child would sit down to do a sum; he would take his slate pencil, and in order to quicken his brain he put the pencil into his mouth, and afterwards put it back into his pocket. Another lad would borrow the pencil, and very often infection was carried in that way. And then there was the use among themselves of the same drinking cups. Now all this meant that what they could do was to get teachers to help, and that when they knew there were cases of slight sore throat in their schools they should be on the alert and inform the Medical Officer of Health. That had been exactly contrary to their custom up to the present. It had been pointed out in many formidable epidemics that school teachers, in order to show they had a good school average, had been in the habit of hunting up children, and where they had been away through illness, getting their mothers to send them back in order that the Inspector might find a high level of attendance. He felt sure if school teachers recognised the danger of young children with sore throats coming to school without being inspected by the Sanitary Authorities, they would do a great deal to check the spread of diphtheria.

A SPECIAL meeting of the Ilkley District Council summoned in accordance with a requisition of four of the members was held last week for the purpose of discussing the advisability of calling a public meeting to consider and vote upon several important projects at present before the Council. The first was the proposal now before the Council to purchase a site on the moors and to erect thereon a storage reservoir of a capacity of 8 million gallons. The objections to the scheme are that it is far in excess of the requirements of the township, and would involve an unwarranted expenditure. It was decided to call a public meeting.

THE Thorne (Doncaster) water supply question has now reached an acute stage. Over eight years ago Dr. Bruce Low (of the Local Government Board) reported that the water supply of Thorne and several adjoining villages was about as bad as it well could be, and recently the West Riding County Council have moved in the matter, insisting upon a better water supply being provided. At a recent meeting of the Thorne Rural District Council the whole question was discussed, and it was unanimously decided to ask Messrs. Fairbank and Son, C.E., of York and Westminster, to meet the Council on the 9th inst. and advise it as to the best means of providing a waterworks for the supply of Thorne, Hatfield, and Stainforth.

Coming Municipal Men.

XVIII.—MR. T. C. GOLDER, Borough Surveyor of Deal.

Mr. Thomas C. Golder is a native of Folkestone, and received both his education and early professional training in that well-known Kentish health resort. He was fortunate in being articled to Mr. A. W. Conquest, A.M.I.C.E., the Borough Engineer and Surveyor to the Folkestone Corporation, a gentleman whose abilities did much to raise the town to the high position it now occupies as a health resort, and whose death in his prime was greatly deplored. On the appointment of the late Mr. John White, A.M.I.C.E., to the vacancy, Mr. Golder became his assistant, being appointed on Mr. White's recommendation.

MR. T. C. GOLDER.

The works upon which Mr. Golder was engaged at Folkestone were of a varied and responsible character, and included large extensions of the sewerage system, embracing the construction of about two miles of large circular sewer to take the Cheriton drainage; long lengths of 6ft. × 4ft., and 4ft. 6in. × 3ft. 6in. brick culverts for the enlargement of the main sewers; also a high-level brick culvert, and the construction of a new 3ft. diameter outfall, carried out into the sea on iron piles. In laying out ornamental grounds and extensions to the Fever Hospital, Mr. Golder was also actively employed, and during his *régime* many of the main streets were paved with Jarrah wood blocks, and plans and estimates were prepared for the apportionment and making up of nearly twenty new private streets. The preparation of plans for, and the construction of, underground lavatories and other public buildings also occupied his attention.

Mr. Golder relinquished his appointment under the Folkestone Corporation to take up his present position as Borough Surveyor to the Corporation of Deal some six years ago, and in this capacity he has designed and carried out many works and improvements. One of the most important of these designs is the Central Deal Improvement, comprising a long length of sea wall, a promenade, and a new road, &c; a new ornamental bandstand, a shelter seat, large underground lavatories with baths, ornamental surface lavatory and baths for ladies.

In addition to these essentials of a growing health resort, extensions to various sewers, and the drainage of undrained roads, and widening and improvement of various public streets, necessarily provided Mr. Golder with congenial work. Nor has this been all, for new depôt buildings, including stables, large stores, stableman's house, cart sheds, and a mortuary have also occupied his time and attention. And last though not least, must be added his plans of an infectious diseases hospital, with the various essential blocks.

During Mr. Golder's time at Deal, the system of collection of house refuse has been entirely re-modelled to meet the requirements of a health resort, and he has also had under his supervision the sanitary inspection of the district, and the bringing of the house sanitation up to the requirements of the time. That the efforts have not been lost upon the Corporation of Deal is evident by the fact that they voluntarily increased Mr. Golder's salary about a year ago, and at the same time expressed their appreciation of his services.

Some idea of the progressive attitude of the Deal Corporation may be gathered from the fact that during the last four years the waterworks have been acquired compulsorily by the joint authorities of Deal and Walmer, the purchase price being about £63,000, and proof is not wanting to show that this has been a very successful undertaking; seeing that last year there was a profit of something like £500, which went towards the lessening of the rates at Deal, and this notwithstanding that considerable outlays were made in laying larger main supply pipes, and making extensions to the works.

After the acquisition of the water supply, the town then turned its attention to its drainage, and no less a sum than £40,000 has been expended on new drainage works including extensions to the sewers and the construction of a pumping station, a reservoir, and a new outfall, and these new works are now almost completed, so that the town of Deal in a few weeks will be second to none for the excellence of its water supply and its drainage.

During last summer Mr. Golder read a paper at the Town Hall, Deal, before the Association of Municipal and County Engineers, who visited the town, entitled, "Some of the Municipal Works at Deal," and after a discussion of the paper, which was well received, the members visited the various works, and were much interested in the same, especially the "Foreshore Protection Works," which comprised a number of groynes in front of the northern sea wall on the "case system."

With youth on his side, and an experience so varied, Mr. Golder may be said to possess unique chances of going forward in his profession, and in including him in this series we have every confidence that our anticipation in this direction will be fulfilled at no distant date.

THE HEALTH OF LONDON COUNTY.

In a brief note we last week referred to the issue of the annual report of the Medical Officer of Health for London (Dr. Shirley Murphy) in the year 1899. We also gave the summary of the births, marriages, and deaths, but we now propose dealing with these matters in greater detail. The greatest difficulty, however, which faces us in dealing with Dr. Murphy's report is the minuteness of the details set forth, and the seeming impossibility of condensing them without losing some facts of the greatest import to students of, and workers in, the domain of public health. It is only when there is placed before us such exhaustive and comparative tables as we here find, that we truly realise the greatness of the Metropolitan County.

Take, for instance, one of the first tables. In making a comparison of the death-rates, the eleven largest boroughs are given, but the population of all combined does not equal that of London. With a death-rate of 19·6 London takes the fifth place in this list, the first being held by West Ham with 17·2 and the last by Liverpool with 25·6. In the diagram showing the deaths from all causes, we see the remarkable improvement which has been maintained in the health of London for the past thirty years. Taking the period from 1841 to 1899 inclusive, we have a mean death-rate of 22·6 per 1000. From 1841 to 1871 only in five years did the annual rate fall below the mean, but from the latter year to 1899, it has only exceeded it twice, viz., in 1875 and 1878. Thus in the last decade alone thousands of lives have been saved, as seen by the following table:—

Period.	Mean lives gained.	Life capital gained.
1891-4	1042	79,606
1891-5	1304	85,519
1891-6	2461	104,742
1891-7	3587	142,460
1891-8	4161	161,331
1891-9	4095	172,763

Many other tables are given, in which the returns are thoroughly analysed, and several interesting facts brought out. From the general Dr. Murphy goes on to the particular, and there follows an exhaustive inquiry into the deaths arising from the principal zymotic diseases. The rates from these for the past ten years are:—

1891	2·27 per 1000.
1892	2·80 ,,
1893	3·04 ,,
1894	2·65 ,,
1895	2·62 ,,
1896	3·11 ,,
1897	2·56 ,,
1898	2·77 ,,
1899	2·46 ,,

The number of deaths from the principal zymotic diseases, viz., small-pox, measles, scarlet-fever, diphtheria, typhus, enteric, ill-defined fevers, and diarrhœa, was 11,174, giving an annual rate of 2·46 per 1000. The eastern group of districts had the highest mortality from the principal zymotic diseases in 1899, viz., 3·17 per 1000 living, and the western the lowest (1·91). Among the sanitary districts, St. George, Southwark, had the highest death-rate (4·53), and St. Martin-in-the-Fields the lowest (1·07). The deaths from small-pox numbered 3 in 1899, and 7 deaths were attributed to "cow-pox and effects of vaccination." The number of deaths from measles was 2141, as compared with 3077 in 1898. The vaccination returns show that the number of children "unaccounted for" continues to increase. In 1875, the percentage of such cases on the total number of births was 8·8; in 1880, and in 1885, 7·0; in 1890 it had risen to 13·9; in 1895 to 24·9; and in 1897, the latest available returns, 29·1. It will be some time yet before we shall be able to rightly judge the effect of the new Vaccination Act in this direction.

In the distribution of measles mortality in London throughout the year 1899 the eastern group of districts had the highest death-rate, and the western the lowest. Among the sanitary districts St. George-in-the-East had the highest death-rate (1·20), and Plumstead and Paddington the lowest (0·05). During the first quarter of the year the measles mortality in London was 0·34 per 1000 living; the death-rates in the northern, central, and eastern groups of districts exceeding this average. During the second quarter of the year the measles death-rate in London rose to 0·61 per 1000 living; the death-rates in the northern and eastern groups of districts being above the London average. In the third and fourth quarters of the year the London death-rate declined to 0·47 per 1000 living; and the eastern and southern groups of districts were above the London average in each of these quarters. In each quarter of the year the eastern group of districts had a measles death-rate considerably in excess of the London average.

The cases of scarlet fever notified during 1899 numbered 18,224, compared with 16,920 in 1898. The number of deaths registered from this cause in 1899 was 398, compared with 581 in 1898. In the distribution of scarlet fever mortality in London throughout the year 1899 the central group of districts had the highest death-rate (0·11), and the eastern group of districts the lowest (0·06). Of the districts, the mortality was highest in Rotherhithe (0·27), and lowest in St. Giles and St. Martin-in-the-Fields. During the first quarter of the year the southern group of districts had the highest death-rate (0·11), and the central group the lowest (0·03); during the second quarter the western group of districts had the highest death-rate (0·11), and the eastern the lowest (0·04); during the third quarter of the year the central group of districts had the highest death-rate (0·12), the death-rates of the northern, eastern, and southern groups being equal, viz., 0·07 per 1000 living; during the fourth quarter of the year the central group of districts again had the highest death-rate (0·20), and the eastern group the lowest (0·07).

In Plumstead early in the year there was a small epidemic of scarlet fever, and Dr. Davies, the Medical Officer of Health, could not exclude the milk supply as a possible source of the disease; one firm of wholesale vendors practically refusing to tell him the source of their supplies. Through his recommendation the attention of the Local Government Board and the London County Council was called to this fact, the latter body endorsing the view that all vendors, wholesale or retail, should be compelled to declare the sources from which they receive their milk. Without this power it is very difficult to trace possible means of contagion. An inquiry was also made into the prevalence of scarlet fever at various periods of school attendance. From the 28th to the 31st week of the year, 1472 cases among children were reported; in the 32nd to 35th (the holiday period) 1172; and the first four weeks of return to school (36th to 39th) 1688. After this it will be difficult for anyone to deny the absolute necessity for the exercise of greater care in sending children to school from infected homes. September and October are the black months of the year for scarlet fever, the number of cases, at all ages, being considerably above the mean during these two months. With but few exceptions, the notifications received during the first five months were below the average.

The cases of diphtheria notified in 1899 numbered 13,711, compared with 11,883 in 1898. The number of deaths registered from this cause in 1899 was 1946, compared with 1760 in 1898. In the distribution of diphtheria mortality throughout the year 1899, the

southern group of districts had the highest death-rate (0·55), and the western group the lowest (0·26); of the several districts St. George, Southwark, had the highest death-rate (1·04), and St. Martin-in-the-Fields the lowest (0·08). How persistently infectious is diphtheria is shown by a case quoted. A child who had suffered from diphtheria in the Fountain Fever Hospital was discharged in the middle of August. She went to Leytonstone for a month, returning to Fulham in the middle of September. Her mother contracted diphtheria, and was removed to the hospital on October 2nd. The girl returned home and slept with the father, who suffered from diphtheria, on October 23rd. On October 21st the child went to stay with some relatives in another street in Fulham, and on November 6th her cousin developed diphtheria. Shortly after this she went to visit an uncle and aunt at Kingston-on-Thames both of whom were attacked with diphtheria. Reporting on this extraordinary case, the local Medical Officer says that "Several bacteriological examinations were made, and the bacillus of diphtheria was found on every occasion in the nasal secretion until the end of January, though both the throat and nose appeared perfectly healthy."

There were 1728 fatal cases of whooping-cough in 1899 against 2160 in 1878.

A considerable space is devoted to enteric fever. During the year the number of cases notified was 4467, an increase of 1436 on the previous year. The deaths were 759 against 554. The highest death-rate was 0·43 in the City, and the lowest (0·04) in St. Saviour. A review is given of the remarks made by the various Medical Officers on the circumstances surrounding the outbreaks in their respective districts. Several point out possible causes, but others have failed in their attempts to discover any reason for the advent of enteric into their divisions. In several reports, moreover, illustrations of the communication of this disease from one person to another are given. The experiences of enteric fever in 1899, as, indeed, that of previous years, points to the spread of enteric fever from cases of this disease, the nature of the illness of the first case not being recognised. It further shows the risk of the retention of cases of enteric fever in the houses of poor persons when the conditions of life are such as to give opportunity for extension of the disease. The only recognition of enteric fever, the use of the Widal test in all doubtful cases, the isolation of the sufferer, and the employment of persons beyond middle life to attend upon the sick, all are needed to limit such spread of the disease. The year 1899 was characterised by excessive prevalence of enteric fever in the latter part of the year. There was marked increase above the average in the 40th-46th weeks, the increase being most manifested in the 43rd, 44th, and 45th weeks. Thus there was a marked increase in the number of cases notified in the 40th week (week ending October 7th), a fall in the 41st week, and from that time a rapid rise in each successive week—42nd, 43rd, and 44th. The prevalence showed a trifling decline in the 45th week and a rapid decline in the 46th week, after which the fall in each successive week (with one exception) was continuous and rapid. This excess of prevalence was manifested over wide areas of London, both on the north and south of the Thames, the districts on the north of the river which were most affected being those in the east of London. It is interesting to observe that some difference in the relative proportion of males and females attacked is observable in the year 1899 when compared with the two preceding years. Thus in 1899, in the four weeks 42-45 the proportion of females attacked was greater than in the rest of the year, in 1897 and 1898 it was less in these four weeks than in the rest of the year. It will be seen, therefore, that in 1897 and 1898 the proportion of females was less in the weeks in question than in the remaining portion of the year, and that in 1899 the position was reversed. When the proportion of females over 15 years of age in the four weeks in question in 1899 is compared with the proportion in the corresponding period of the two preceding years, it is found to be somewhat smaller. Thus the number of females over 15 years of age per cent. of total females attacked was in 1897 69·3 per cent., in 1898 67·1 per cent., and in 1899 65·1 per cent. Again, when the lists of notified cases of infectious diseases are examined, it is found that secondary cases in invaded houses were greater in 1899 than in the preceding two years. Thus the proportion of secondary to total cases in the latter six months of each of these years was—1897 8·7 per cent., 1898 8·9 per cent., 1899 10·9 per cent.

Summing up the matter, Dr. Murphy says that in connection with possible causes of the behaviour of enteric fever in 1899 it is deserving of notice that floods in the rivers did not precede the increase under consideration as in 1894, when they preceded an increase which I believe was due to pollution of water supply. There was, however, in the large excess of cases in the 43rd, 44th, and 45th weeks, suggestion that some undiscovered infected food supply was contributing to the total prevalence which occurred during these weeks. As the result of considerable inquiry in those districts in which the prevalence of the disease was most marked, I have been unable to obtain any evidence indicative of a particular common cause of enteric fever in the weeks mentioned. Apart from the increase in these weeks, there was larger autumnal prevalence of this disease than in any recent year, and it may be stated that during the last few years there has been increasing autumnal prevalence, probably due to natural causes.

The deaths attributed to influenza, which in 1898 numbered 1283, rose to 1817 in 1899, the corrected annual average for the preceding ten years being 1272. The deaths attributed to bronchitis numbered 9195, being 1008 below the corrected annual average for the preceding ten years; the deaths from pneumonia, however, were 597 in excess of this average, and numbered 6666. The deaths from phthisis were 8291, giving an annual rate of 1·88 per 1000. Mortality from all causes, from phthisis, and from all causes other than phthisis, increases with overcrowding, and that the maximum increase from diseases other than phthisis occurs somewhat earlier in life than the maximum increase from phthisis, while in this diagram the conditions under which the inhabitants are housed as far as can be considered, it must be recollected that the population which is badly housed suffers from other consequences of poverty than insufficiency of dwelling accommodation. But however much these other conditions may contribute to the production of phthisis, there is ample reason for thinking that the dwelling itself and the manner in which it is occupied are important factors in determining the prevalence of this disease. It is interesting to consider in this connection the measures which are now in the main relied upon for the cure of phthisis. They consist in the placing of the patient by night and by day under conditions which are mostly widely different from, and, indeed, are directly opposed to, those which obtain in the overcrowded tenement. In so far as these measures are successful in effecting the cure of phthisis the overcrowded dwelling must be deemed to promote the disease, and hence the effects of overcrowding upon phthisis mortality may be understood.

Three cases of bubonic plague were reported, but happily they were successfully dealt with, and at no time was there any possibility of the disease being spread in the port of London.

The West Bridgford Urban District Council has resolved to establish a refuse-destructor, to erect some cottages and stables, and to enlarge its sewage farm.

THE COLLECTION OF HOUSE REFUSE.

By A. Taylor Allen, Mem. Soc. Engineers,
Portslade-by-Sea.

The law relating to the collection of house refuse and the consideration of a system of collection, whether by contract or direct, affects every Municipal Authority. Under Sec. 42 Public Health Act, 1875, every Local Authority may undertake or contract for the removal of house refuse, either for the whole or part of their district, and under Sec. 44 of the same Act, they may make bye-laws imposing the duty of carrying out such work on the occupier of any such premises, but under Sec. 26 Public Health Amendment Act, 1890, this power is more favourably extended, as under that section they may impose such duties on occupiers as will *facilitate* the work of collection.

Consideration should first be given to the question whether the Authority should make bye-laws under Sec. 44. It is a matter of considerable importance that all refuse and excremental matter should be removed from houses as often as practicable; it must be borne in mind that in districts where very few of the houses have sufficient garden ground for the proper disposal of such refuse, considerable difficulty will be experienced when the duty is imposed upon the occupiers.

In urban and populous rural districts it is very essential that the Local Authority themselves should remove all house refuse to ensure its frequent and regular removal, and prevent both nuisance and constant risk of injury to health, and when this is the case it is well that the Authority and their officers should be acquainted with Sec. 43 Public Health Act, 1875. "If the Local Authority themselves undertake or contract for the removal of house refuse from premises, and fail without reasonable excuse after notice in writing from the occupier of any house within their district requiring them to remove house refuse within seven days, the Authority are liable to a penalty not exceeding 5s. per day."

The writer is strongly in favour of the direct system, that is, the Authority doing the work themselves with their own horses and staff, and the use of properly constructed covered carts or vans.

The disadvantages of the contract system, that is, the Authority letting the contract to a local contractor, is that often the horses employed are anything but a credit to the town, and the men uncivil, the latter being accounted for by the reason that such contracts are generally made for one year only, and the men disliking the work have no reputation to sustain and do not stay long enough to become acquainted with the work. (Here the writer may remark that he cannot see why "dustmen" should not be provided with a suitable uniform for their work as are Inspectors, firemen, and other officers of the Council.) With the contract system there is always experienced a difficulty in getting the work done expeditiously and as regularly as it should be, and the men are not so directly under the control of the Surveyor or Inspector as they would be if done by their own staff.

The system adopted in some towns of placing the refuse in tubs or iron receptacles for collection in the early morning is faulty in case of a wind blowing the lighter refuse away, and the contents of the receptacles being overhauled and overturned by people who are in the habit of picking out materials for selling as a mode of livelihood.

Where the Local Authority undertake the work on the contract system, it is very important that a definite specification and form of tender should be drawn up, and the writer submits an abridged specimen.

Specification.

Generally.—The person whose tender shall be accepted, hereinafter called the contractor, is to covenant for himself, his executors, and administrators for a period of . . . years from the date of the signing of the contract, to effectually collect, remove, and take away in suitable carts, all dust, including dirt, ashes, clinkers, cinders, shells, vegetable matter, and rubbish of every description that may be found deposited in any ashpit, dustbin, or like receptacle belonging to any dwelling-house in the urban district of . . . . on such days as the Council or their authorised officer shall from time to time direct, and shall execute all such directions, and abide by any regulations that may be necessary for the execution of the work.

Horses, carts, and implements.—The contractor to provide, at his own expense, all horses, carts, labour, brooms, baskets, shovels, ladders, implements, and utensils of whatsoever kind may be necessary for the proper execution of the work and the prevention of any nuisance arising therefrom.

The contractor shall employ only such men as are honest, steady, and civil, and able-bodied.

The contractor shall employ good, well-bred, strong cart-horses, with proper and suitable harness, and shall provide all food, water, forage, shoeing, and every requisite necessary for keeping the horses and tackle in satisfactory condition.

All horses, carts, and men shall be subject to the approval of the Council, and the Council or their officer may from time to time summarily dismiss any horse or cart which in their judgment is unsuited or unfitted for the work, or men who shall act in an improper, uncivil, or offensive manner to any officer of the Council or any inhabitant of the district.

Solicitation of money prohibited.—Neither the contractor or any of his men shall be entitled or permitted to solicit from any of the inhabitants of the district or their servants any money, reward, beer, or other drink, for any duties performed under this contract.

Negligence of contractor.—In case of any failure or omission of the contractor to fulfil his contract, the Council shall have power, after giving twenty-four hours notice to the contractor, to collect, remove, and cart away any dust or refuse, to employ some other person or persons to execute the said work, and the contractor shall, on demand, pay to the Council all costs and expenses incurred in doing the work so neglected or omitted to be done by him.

All notices to the contractor shall be duly served upon him if given to, or left for him at his residence, and may be signed by either the Surveyor, Inspector of Nuisances, or Clerk for the time being of the Council.

Contract not to be sublet.—The contractor shall not assign or dispose of the contract, or any part thereof, or sublet to any person or persons whomsoever.

Contractor's responsibility.—The contractor shall take the risk of all accidents of any kind whatsoever happening to any horses, carts, or men employed under the contract, and shall be chargeable for any contract done by them, and shall, at his own expense, reinstate and make good all or any injury or damage which may happen by reason of the execution of the work, whether such injury or damage may occur to any house or building, or any matter or thing therein, or to any highway or footpath in the said district, and he shall indemnify the Council from all actions, lawsuits, damages, and expenses which the Council may be subjected to.

Payments.—Payments to be made to the contractor by quarterly instalments, subject to deductions as aforesaid (if any).

Disputes.—Any question arising as to any matter or thing arising out of or incident to the contract shall be left to the Surveyor, whose decision shall be final and binding on all parties.

Form of Tender.

..... the undersigned hereby tender to supply horses, carts, and men, and collect, remove, and carry

away all dust and refuse of every description in and from the several houses, buildings, and premises within the district of the ..... Urban District Council, according to the specification, schedule, terms, and conditions of contract, for, and in consideration of the sum of ..... pounds ..... shillings. And..... hereby undertake to execute a contract for the due and proper performance thereof, and ..... prepared to find sureties to your satisfaction.

Dated this ..... day of 190

Signature .....

Address .....

Profession or calling.....

The above might require a little modification in certain districts as regards tips and disposal of refuse. The author wishes to point out that there is no statutory definition of "house refuse," and the Local Government Board are not prepared to advise as to what may or may not be included in the expression in the varying circumstances of particular cases. Whether shop refuse should be included with house refuse has caused much agitation in some districts, and for the benefit of readers, the writer gives a summary of information received from thirty-eight cities and towns :—

27 collect shop refuse generally.
2 collect it in small quantities.
9 do not collect it.

Therefore, about 75 per cent. collect shop refuse out of the 38 cited above.

23 make no charge.
3 charge for large quantities.
2 charge on an average of 2s. per load.
1 charges 10s. per quarter.

It may also be noted that 8 out of the 38 are in possession of refuse destructors, 3 use it to raise low-lying ground, while the remainder tip and burn it.

The writer is of an opinion that much delay and inconvenience would be saved if Local Authorities could adopt a card system with "D" or "Call" printed on, and the date and day the dustman should be expected in this particular street, so that any occupier having dust could place their card in the window.

THE FIRST MUNICIPAL CREMATORIUM.

The first crematorium erected by any municipality in England was opened at Hull last week by the Mayor (Alderman Gelder) in the presence of an assembly representative of the public life of the city, including clergymen and ministers of all denominations, medical men, and members of public bodies. The Mayoress, Sir James Reckitt, Sir Robert Craven, Councillor S. Cohen (chairman of the Corporation Burial and Parks Committee), and a number of ladies, were amongst those present.

Occupying a site adjoining the Hedon-road Cemetery, through which entrance is gained to it, the crematorium is a red brick building in the early perpendicular style, freely treated. It comprises a hall, or chapel, 24ft. square, a second room containing the incinerating chamber, and a tower 70ft. high.

The cremating apparatus is a furnace of the regenerative type, designed by the late Mr. Henry Simon, president of the Manchester Crematorium Society. The degree of heat can be regulated in the most exact manner. There is no smoke and little visible flame before the body is introduced, and if the coffin is made in accordance with the regulations there is no smoke and no noise during cremation. The process occupies about an hour, at the end of which there only remain the inorganic bases of the bones, in the form of silvery-grey pumice-like fragments. These are removed by passing an asbestos brush through the chamber, which causes the remains to fall through an opening into the urn which is to receive them. The interior of the cremating chamber is, of course, at no time visible to mourners. The charge for cremating residents within the city is £1 1s., for other persons, £3 3s. These charges include storage of cremated remains for a period of twelve months. The cost of the crematorium has been about £2500.

Councillor Cohen, after some introductory remarks, presented a gold key to the Mayor, who opened the door, and the company were admitted into the chapel. Here, at the request of the Mayor, the Rev. Dr. James (St. Thomas's, Hull) read a portion of Scripture, and the Rev. Joseph Robinson (Wesleyan) offered a short prayer.

The Mayor, in declaring the crematorium open, said this was quite a new departure in municipal undertakings. It was only within a recent period that powers were given to municipalities to establish crematoria, and it was gratifying to know that in this respect Hull had led the way. The example was being followed by other municipalities. Last year several obtained powers, and this year many more were approaching Parliament in the same direction. People who had not studied the question might not realise how necessary an undertaking like that was in a large city. When they came to realise that at least half-a-million people died in one year in the United Kingdom, they would at once see how that might be a serious menace to the health of those who lived in the large cities and towns. Especially was it so in Hull. He knew of no other place where steps should be sooner taken to restrict as far as possible the burial of the dead in the cemeteries—for this reason, the subsoil was of clay, which was wet in winter and depressing to all to bring their dead to; and in summer the heat caused the ground to crack and emit gases which were a distinct danger to the public health. Therefore if they could take any steps to restrict interments they would be doing a great public service. There were, of course, prejudices against cremation, and possibly the greatest at the present time was the religious one. People would not be educated readily, but he could quite realise that after a certain period of education it would become quite a common occurrence for people to be cremated rather than buried. The Authorites in Hull had no desire to force the pace. They did not want the citizens to imagine that cremation was compulsory; but they did want to provide a place for those who, in the interests of sanitation, desired cremation rather than burial. It might be years before it would become a popular form of disposing of the dead. They were just at the dawn of a new century, and if he might venture to prophesy, he should say that before its close it would become the only form of disposing of the dead in this country.

The company were then shown the procedure for the admission of a body into the incinerating chamber, and urns were also exhibited. The crematorium was tested on Saturday, the carcase of a sheep being incinerated. All that remained were a few bones, which were placed in one of the urns for inspection.

At the close of the ceremony the company adjourned to the Town Hall, where tea was served.

The Municipal Council of Hay (Australia) has decided to improve the water supply by adopting the recommendation of the Government engineer to erect two new duplex pumps to lift 40,000 gallons per hour, a new boiler, and an additional storage tank of 100,000 gallons capacity. The plant will be placed near the irrigation pumping station, and water will be pumped direct from the river. The estimated cost is £6800.

THE BACTERIAL TREATMENT OF CRUDE SEWAGE.

The third report of Drs. Clowes and Houston on the experimental intermittent treatment of London crude sewage at the coke beds at Barking and Crossness has reached us. The first report was issued early in 1898, and dealt with the sewage as it arrived at the outfalls at Barking and Crossness. This was followed by a second report, giving the results obtained by the chemical and bacteriological examination of the crude sewage and of the effluent from the coke beds at Crossness. A supplementary report on the deposit found upon the coke of the coke beds was issued in October, 1899.

The present report gives a similar statement of the results obtained in the experimental bacterial treatment which has been carried out at the northern outfall (Barking) and of the experimental treatment carried out at the southern outfall (Crossness) since the issue of the last report. The superintendence of the chemical work has rested in the hands of Mr. E. Brooke Pike, the chemist at the northern outfall, and of Mr. J. W. H. Biggs, the chemist at the southern outfall, and the successful carrying out of the processes has been due to the careful work of these gentlemen and to the co-operation of Messrs. H. Stokoe and E. J. Beal, superintendents at the outfalls. The bacteriological work has been in the hands of Dr. Houston, who makes a separate statement of his results.

The process employed at both outfalls has been that of "intermittent contact" with frequent aëration of the coke surfaces. The acre coke bed at the northern outfall has received an effluent resulting from sewage which has been mixed with solutions of lime and iron sulphate, and has then been subjected to sedimentation. The smaller coke beds have received sewage which has not been mixed with chemicals, and which has, as a rule, not been freed from its suspended solid matter by sedimentation. Since the cellulose substances in the suspended solid matter of the sewage are only dealt with slowly by the bacteria in the coke bed, they tend to accumulate on the coke and to diminish the sewage capacity of the bed; they also tend to diminish the extent of purification from the dissolved organic matters of the sewage. Hence the acre bed, which receives the effluent from chemically-treated and sedimented sewage, has yielded better results than the smaller experimental beds. A very rough process of sedimentation of the sewage, without the use of chemicals, was effected at the southern outfall by allowing the crude sewage to flow through a large tank on its way to the coke bed. This sedimentation considerably retarded the choking of the coke beds.

Last Christmas an experiment was made on the whole of the South London sewage by allowing it to flow at a comparatively rapid pace through one of the large settling channels at the outfall works. In this way the larger portion of the solid suspended matter of the sewage was deposited; a portion of the effluent from this sedimentation process was treated in a small bacterial coke tank and was found to undergo the usual amount of purification, and to furnish an almost clear and entirely inoffensive and non-putrescible effluent. No reduction in the capacity of the coke bed occurred during the period of experiment. From this experiment it may be inferred that simple rapid sedimentation of the crude sewage on the large scale, followed by intermittent bacterial coke treatment will furnish an effluent suitable for the lower river, together with a sludge deposit which could be dealt with in the usual way. It seems reasonable that the experimental treatment of the sewage by rough screening, followed by rapid sedimentation without the previous introduction of chemicals, might now be attempted on a larger scale, and that by this means an effluent of much greater purity than that at present discharged might be sent into the river.

The general result of experience with the various coke beds has been that they increase in efficiency as the duration of their service increases, and that some considerable period of service is necessary before they exert their maximum amount of purification of the sewage. Dr. Houston summarises the previous reports issued by the Council, and gives details of the bacteriological work which he has carried out since the issue of those reports. As regards the general bacteriological aspect of the treatment of London sewage, Dr. Houston gives a statement of the conclusions at which he has arrived after two years' study of the problem on behalf of the Council. From this it is made evident that Dr. Houston concurs in the advisability of adopting the bacterial method of treatment of London sewage in place of the chemical treatment, and maintains that under the conditions existing in the lower river and at the outfalls, this system of treatment would furnish a more satisfactory result. But he states that although the effluent from the bacterial beds would not lead to nuisance in the river, it would be by no means a satisfactory liquid to introduce into a part of the river which was used for drinking purposes.

A PIONEER IN SANITARY SCIENCE.

Sir William MacCormac called attention, in a letter to the *Times* last week, to the services rendered to sanitary science by the venerable Sir John Simon. He said:—"In 'The *Times* History of the Century,' and for the year 1849, some allusion might well have been made to the all-important and epoch-making work of Mr. (now Sir John) Simon, in the development of sanitary science. In the first leading article of the *Times* of November 8th, 1849, you say:—'If any number of this journal ever deserved to be rescued from the usual fate of ephemeral publications, and regarded as a "possession for all time," it is that of yesterday. Contrary as it is to our practice to devote so many columns to one subject, unless it be a parliamentary debate, the extreme gravity of the topic in this instance, and the extraordinary interest of the documents by which it was illustrated, decided us to publish them simultaneously and entire. Mr. Simon's annual report to the City Commissioners of Sewers is unquestionably the ablest most lucid, and most temperate statement of our sanitary condition and wants that it has been our fortune to peruse, and we are greatly mistaken if it is not the programme of an earnest movement and the foundation of a substantial reform.' Your prevision has been realised, and the expectations of the writer of the article have been more than fulfilled. Sir John Simon may be truly said to be the creator of sanitary science in all its modern aspects, and his work has stimulated and guided the civilised world. Sir John Simon was a great surgeon, and preceded me in the office I now hold of President of the College of Surgeons, and to him it has been given to exercise an untold influence in the furtherance of the public health and the prevention of diseases. It is not possible to over-estimate the value of his labours. To give one example only, it is sufficient to look around and to note that London has become the healthiest great city in the world."

The Leeds City Council has unanimously resolved to promote a Parliamentary Bill empowering it to make additional waterworks and for other purposes, including the making of a crematorium, the consolidation of the city securities, and the adoption of the mansion on the Harehills Estate as judges' lodgings.

Sanitary Inspectors' Associations.

LONDON.

The usual monthly meeting of the Sanitary Inspectors' Association was held on Saturday last, at the Carpenters' Hall, London Wall. Mr. W. H. Grigg, the chairman of the Council, presided, and those present included Messrs. Warwick, Jordan, H. Alexander, T. G. Dee, Legg, Wallis, Baxter, I. Young, Ashdown, W. W. West, Langster, E. Tidman (hon. sec.), &c.

THE PRESIDENTSHIP.

After routine business and the election of a number of members,

The Chairman explained that the usual New Year's address would be delivered by Mr. W. W. West, of Walthamstow, an old and highly-respected member of the Association. This was a departure from the custom of many years' standing, that the president of the Association should deliver that address, but he regretted to inform the members that it was impossible for their president, Sir Hugh Gilzean Reid, to discharge this annual duty. Sir Hugh had quite broken down in health, and had gone abroad, and he doubted if they would see him again for a long time to come. Under the circumstances Mr. West had kindly stepped into the breach, and would give them an address which was in every way up to the standard. It was a curious thing that of the four presidents the Association had had, two should have been lost to them by death, namely, Sir Edwin Chadwick and Sir B. W. Richardson, and two by a complete breakdown of health, viz., Sir John Hutton and Sir Hugh Gilzean Reid.

SANITARY IDEALS FOR THE CENTURY.

Mr. W. West, who was well received, in addressing the members, said that he had no startling or brilliant suggestions to put forward, but he desired to ask their attention to a few thoughts on "Sanitary Politics." During the latter half of the century that had just closed, sanitation had taken giant strides, and the work of remedying the bulk of the bad conditions which prevailed had been put well on the way. Half a century was not a great period in the history of a nation, and the difference between the conditions prevailing fifty years ago and the conditions prevailing to-day were a subject for intense gratification. Food, drainage, the construction of dwellings, water supply, infectious diseases, had all been taken in hand, and the grosser evils at any rate removed. A good deal of the present work of sanitary inspectors was due to the greater refinement of opinion and sentiment, delightful to the thoughtful citizen, and worlds above the every-day notions of fifty years ago. Granted that a vast improvement had been effected—an improvement indicated by the reduction of the death-rate in London to about 18 per thousand—what is the question which most presses for settlement to-day? As the dying German philosopher is said to have cried for "Light, more light," so the anæmic, enervated dwellers in our cities to-day cry for "Air, more air." Overcrowding in cities is our trouble. There had been an enormous reversal of our mode of life from the open air of the countryside to the close confinement of towns. This was the subject which most agitates the minds of sanitarians as requiring their best efforts for a solution. The suggestions for modifying the evil could be divided into two categories—those which aimed at palliating the unwholesome conditions, and those which dealt with the evil radically by abolition. In default of removal all would assist in ameliorating, but amelioration had been tried to a greater or less extent with varying, but on the whole small success. For instance, the minimum air space allowed for rooms is necessarily fixed so low as to leave the great bulk of the trouble untouched, and even a determined enforcement of the law did not materially lessen overcrowding. Model or artisan dwellings did not much assist, for the designers of schemes prided themselves on the fact that they made provision for as many or more inhabitants on the cleared space by lifting them nearer the clouds. The fundamental principle of modern sanitation was prevention, and therefore they had to consider what should be done towards that end. He thought they must conclude in favour of those principles which spread out the populations, such as the erection of model villages in the suburbs, with the provision of rapid and cheap transit, and the removal of many manufactories to rural districts. Politics being taken to be the methods by which a policy is effected, sanitary politics like others must have a policy, which in order to succeed should have definite recognised principles. In the endeavour to secure the adoption of the preventive measures he had suggested, objections and difficulties would be met with at every step; but with definite principles to guide them, considerations of the problems would be assisted to a sound judgment. Now the foundation of all solutions of these great sanitary problems would be found in the Latin phrase "*Salus populi, suprema lex.*" If they insisted strenuously, in season and out of season, that the welfare of the people is the highest of all laws, and to assist the work couple with it the maxim suggested 2000 years ago by the teacher of Nazareth. "Whatsoever things ye would that men should do to you, do ye even so to them," there need be no doubt in their hope that the century now commencing would be as full of advantages or more so than the century which had just ended. Well might the Prince of Wales, at a gathering of sanitarians, ask, "If preventible, why not prevented?" The answer was that the principles he had suggested were not acted upon. There was no other law for sanitarians than that of the welfare of the people. It was said the prevailing bad conditions were brought about as the result of the working of economic law; then the economy must be a false one, and a new one should be put in its place. Men of all shades of politics had said that the working of the land laws was responsible largely for the evils with which sanitarians had to deal. If so, then amend the land laws. In advocating reforms of the character he had described they would be told that they were advocating rank socialism. But they must not be afraid of mere words and idle phrases, for they were but endeavouring to put into practice the principles which underlie all sanitary measures. (Loud applause.)

A spirited discussion ensued, and on the motion of the Chairman, seconded by Mr. I. Young, a hearty vote of thanks was accorded to Mr. West for his address, and the usual private conference of members followed.

For some years the Corporation of Eccles has had before it a scheme for the improvement of Timothy-street and the courts and alleys adjoining. A scheme to demolish all the property and rebuild having been rejected, the Committee appointed to deal with the matter have now submitted a further report. The area contains 141 houses, chiefly occupied by the working class. Since the first scheme was rejected forty of the houses have been condemned as insanitary, and compulsory closing orders issued. The Committee report that the owners do not now intend to stand in the way of the Corporation dealing with the property, and in most cases are prepared to accept a sum which would yield them an income equal to that at present obtained from the property. The Committee has had an interview with an assistant secretary to the Local Government Board, and now recommends the Council to adopt a scheme with this object.

NOTICES.

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AND
Journal of Sanitary and Municipal Engineering.

JANUARY 10, 1901.

HYGIENIC LOCOMOTION.

IT is significant that the first few days of the New Century should have been signalised by another triumph for electricity. The Metropolitan District Railway has long borne an unenviable reputation for discomfort, and its badly-ventilated tunnels have for years been patiently endured by the long-suffering public, who have been compelled, against their will, to make use of this medium of transit. The announcement that the company has resolved to supplant the present method of steam traction, with its sulphurous and noisome fumes, by electrical motive power, will consequently be hailed with undiluted satisfaction by every Londoner. The reason of this important step, which is to be proceeded with at once, was not so much the question of giving the people a healthier mode of travel for health's sake, as affright at the success of the Tube system, which it was feared would enter into competition with and seriously affect the profits of the shareholders. Nor, perhaps, is it reasonable to suppose that when a company is concerned influences other than those of £ s. d. would be likely to carry weight. But luckily for the health of the people, compulsion often comes to the rescue when indifference retards progress, and the promoters of the Tube deserve our best thanks for having rendered the indirect service to the public of making the present position of the District Railway untenable.

Some premonition of what was likely to come was furnished by a successful preliminary experiment between Earl's Court and Kensington High-street, and when we find experts such as Sir J. Wolfe Barry and Sir William Preece sanguine in the matter of its success, we may safely leave the mechanical work of conversion to the ability and skill of the engineer. But the practicability of the scheme we have never for a moment doubted, while its superiority over the existing arrangements from a health point of view have all along appealed to us as being both desirable and imperative. On one occasion it was stated in all seriousness—no doubt by a shareholder—that the atmosphere of the Underground, so far from being innocuous, was positively health-giving; but such a premise was opposed to all the laws of hygiene, let alone of common sense. How many victims these subterranean vaults have claimed will never be known, but we dare aver that indirectly they are numbered by thousands. Such a menace to health should have long ago been consigned to the limbo of things impossible; and it speaks ill for public enterprise in England that its toleration should have been endured till now. In view, however, of what is about to happen we may perchance let "the past dead bury its dead," cheered by the contemplation of a new era wherein health will no longer suffer, and comfort and convenience hold sway. And it is equally consoling to think that this movement in favour of electric traction will not stop short at the transformation of the Underground Railway, but that wherever similar undertakings exist a "rattling of the dry bones" will be heard.

No matter what the sceptics may aver or the ignorant contend, electrical traction is the traction of the future. On every hand the same trend is evident. Trams, 'buses, and every other species of conveyance are gradually but surely coming under its influence. And we hail its latest victory with all the more satisfaction because we see in it the precursor of a universal adoption of electricity, which is undoubtedly one of the most potent agents in the preservation of health which the past century has given to posterity.

A XIXth Century Product.

In concluding its annual review of the progress made in sanitary engineering, the *Engineer* makes some pertinent remarks on the development of the sewage problem. We are justly reminded that when considering the whole question of sewage disposal it is borne in upon us more and more that Nature never intended man to live together in large numbers or to stop continually in one place. As long as he is nomadic there is no sewage to worry about. Congregation in towns makes primitive methods of disposal on the site where produced out of the question. An abundant water supply does not add to the ease with which the problem may be solved. The employment of cesspits in towns—though their action in the country may be eminently efficient—is impossible with safety unless they are frequently cleansed. This process even is attended with disagreeable concomitants. At the beginning of the nineteenth century there was no proper method of sewage disposal. "In London," says the writer, "the cesspit was in extensive use, and the overflow went into stinking ditches, where the fluid remained stagnant and spread disease. It was illegal at the beginning of the century to turn sewage into the various streams flowing into the Thames in London, or into the river itself. Indeed, water for drinking purposes was taken from the river both at Charing Cross and London Bridge. The permission to use these streams for sewage rendered matters better for the time, but the river gradually got into such a foul condition that in spite of the rigorous measures since taken both above, in, and below the City, the river has by no means recovered its ancient purity. London is, however, wonderfully healthy and well drained, and in a much better condition than Paris, in spite of its larger population. Other cities have the same troubles, and they are meeting them in their own way. Sewage disposal as we now know it is, without question, wholly the growth of the nineteenth century; and far advanced as is the science of to-day as compared with what it was one hundred years ago, the matter is still only just in its infancy." All, we think, will agree with this conclusion. Much as we do think of the bacterial treatment, which has received such prominence in the closing decade of the century, we are not sure that it provides the final settlement to the problem. It is more economical in its use of land, but it still requires too much. A possible solution may come in the development of mechanical means of filtration and treatment. The engineer has overcome greater difficulties, and it may be that it is to him that we must look for the next great move in this all-important matter.

What will the London Boroughs do?

There are many public matters to which our contemporary the *Lancet* has rendered excellent service by the appointment of special commissions, conducted as they are by experts. Many phases are inquired into which are passed over by the superficial observer, and the result is that an unbiassed and judicial report is obtained which is of far greater value than the *ex parte* statements of the ordinary newspaper man. Its latest effort has been directed to the housing question in London, and the conclusions arrived at fully confirm what we have often stated, viz., that the crux of the question is largely one of rent; and that even when this is overcome, there is a certain class who will decline to avail itself of better conditions, because of its innate dislike of the restraint necessary to secure healthy houses. In concluding his report the special commissioner points out that of late years the whole problem has presented itself in a comparatively speaking novel aspect. It was supposed that the lowest class lived in low-class dwellings that were so insanitary and dilapidated that the first thing to be done was to pull the houses down. In many instances this is no longer the case. They, on the contrary, live in modern houses of the middle-class type that possess no structural defects and are well drained. But the tenants overcrowd these houses, and such is their poverty, and their dissolute, drunken, dirty habits, that in spite of good drainage and good houses the death-rates in certain areas of this description are generally above 40 per 1000 per annum, and have sometimes exceeded 50 per 1000. It is proposed to make this high death-rate the pretext for municipalising such property; but if the compensation given to the owners of such property is sufficiently high, will not this constitute a premium to those who allow their property to be degraded by the advent of tenants of this class? "Are Borough Councils competent," it is asked, "to become the landlords of the most dissolute and unmanageable section of the community? It is a heavy responsibility, though it is difficult to see by whom else the work can be undertaken. The London County Council shrank from the hazards of such an undertaking: will the Borough Councils display greater courage and enterprise? If the rents are to be reduced — and surely they must be reduced — the profits will be too small to tempt private enterprise. At first the strict regulations and the constant inspection that will be necessary to keep such property in order will have a tendency to drive away the more dissolute among the tenants. They will prefer to pay higher rents to the private speculator who will allow them to overcrowd and to wallow in the dirt which they often much prefer to cleanliness. But when the Local Authorities are able to provide, at low rents, proper accommodation they will then be justified in prosecuting those who prefer to live in insanitary conditions."

Private v. Public Ownership.

The last paragraph of the report discusses the *pros* and *cons* of municipal as opposed to private ownership. And here it is that the great reform is needed. At present a premium has to be paid upon the inflated value given to overcrowded dwellings by the exorbitant rents obtained by private landlords. When this is made impossible, Local Authorities will be able to attack the housing problem with some hope of

success. Social reformers must never forget that high rents are as effective cause of high death-rates as defective drainage, since the high mortality occurs where the drainage and structure of the houses are not at fault, where the streets are broad and the open spaces behind the houses are ample. Of the submerged, those who have sunk deepest in the mire stand first in need of municipal intervention on their behalf. It is in catering for them that private enterprise has most conspicuously failed, and therefore municipal enterprise would be most justifiable. Private enterprise only succeeds because it tolerates overcrowding. Private enterprise which only prospers by breaking the law may well be suppressed. If it can compete with municipal enterprise that observes the law, well and good, if not, it does not deserve to exist. Private enterprise subdivides into tenements a house worth £40 a year and charges £90 a year to the sub-tenants. Municipal enterprise need not charge more than £40 or £45 a year for the same tenements, and it can do this without increasing the rates. "Why, then," asks our contemporary, "should London wait? All that is necessary is to so arrange matters as to prevent the payment of such exaggerated compensation or purchase money as would handicap municipal enterprise by entailing too large an expenditure of capital. For instance, if a house worth £40 a year brings in £90 a year because it is subdivided into small tenements and overcrowded by the lowest class of tenants, the compensation for expropriation should be estimated on the £40 annual valuation and not on the £90. On this basis the re-housing even of the poorest and the most dissolute class could be made to pay, and from the sanitary point of view it is for this class that action is most urgently needed. From the moral point of view, though some of these people dearly love the dirt and disorder in which they live, others, on the contrary, would eagerly profit by any opportunity of raising themselves. In this cause, therefore, the social reformer and the sanitary reformer can press forward hand in hand."

Sanitary Condition of Sydney, N.S.W.

THE latest report to hand by the Australian mail does not indicate a satisfactory state of affairs in Sydney. Notwithstanding the plague visitation the Authorities do not appear to have fully realised their responsibilities. One of the advantages held out to emigrants is that on going to the Southern Cross they go to an almost perfect climate, but what is the use of this if filth and garbage are permitted to rot in the thoroughfares of the cities and round the houses of the people? In reporting on the health of Sydney for the quarter ending September 30th, 1900, Dr. T. Mailler Kendall, stated that the number of deaths from diphtheria, phthisis, diarrhœa, and typhoid fever showed a marked increase, being 166 in advance of the corresponding period in 1899. And he asserted that this high rate would continue so long "as the present system of scavenging and the removal of house garbage existed. The rubbish receptacles required re-modelling in order that the emanations from decomposing matter might not pollute the city." Later on he said that "the barbarous municipal muck-heaps were merely the perpetuation of ancient and bad sanitation, and could possibly be held responsible for the diphtheria mortality." There is nothing in this to attract recruits to the city where the celebration of New Commonwealth have just been held; the worst part is that all these dangers might have been removed long since. There is wealth in abundance, but this is of little value if the people are denied the privilege of living under healthy conditions.

Reorganisation of the Army Medical Service.

THE report of the Special Commission on the treatment of the sick and wounded in South Africa is expected to be issued very shortly, and speculation is already rife as to its probable character. Nothing has been allowed to transpire, so that most speculations may be regarded as pure guesswork, but we hear it stated, on what appear to be fairly reliable sources of information, that the report will be found completely to dispose of the sensational fabric of charges built up by Mr. Burdett-Coutts and his backers. If so, the nation will only be too glad. At the same time there can be no question that any complete scheme of army reform must include a reorganisation of the Army Medical Service. The strain on the resources of the country during the present war has, of course, been altogether exceptional, when the services of civil surgeons and medical men were requisitioned to a large extent. But as it is possible that such an emergency may recur at some future date, it behoves us to see that the organisation of the Medical Service is put on a thoroughly satisfactory basis, so as to be capable of meeting any demands that may be made upon it. The whole subject was exhaustively discussed at a recent meeting of the East of Scotland Tactical Society in Edinburgh. Setting aside the reserve which was natural in view of the pending report of the Royal Commission, many important suggestions were made. Professor Annandale, who presided, said that there should be a reserve of qualified medical officers to supplement the Royal Army Medical Corps. Such a reserve would naturally be associated with the reserve force—the Militia, Yeomanry, and Volunteers—and that could be supplemented by a certain number of specialists retained by the Government for the purpose of being called on if required, or of giving advice in special circumstances. Professor Chiene also threw out a suggestion that there should be an Imperial force or department, and that both in the old country and in the Colonies there should be a body of men and women chosen for their special knowledge in the treatment of disease and injury, the prevention of disease and the nursing of the sick. Every hospital in the country should, he thought, be asked to supply physicians, and surgeons, and the same would hold good with regard to ambulance associations for the supply of orderlies,

and nursing institutions for the supply of nurses and sanitary bodies for the supply of Sanitary Inspectors. For all of these would be required in a properly equipped and efficient medical department. The problem will be so to link such a force — chiefly drawn from the ranks of the civil population—with the army, as to make it readily available in times of crisis for service in the field abroad.

Private Bill Procedure in Scotland.

THE new Act regulating the procedure for Scottish Private Bill Legislation is now in full operation. There has been a rush of Provisional Orders lodged under the new procedure, which appears to be much appreciated and is likely to be taken advantage of. Several of the Orders contain no specific money provisions, but those in which authority is asked to raise capital or to obtain borrowing powers involve a total of £6,090,120, which is a considerable increase over last year. Of this amount it is to be noted that railway undertakings only account for £1,487,120—no doubt owing to the high price of coal and labour, necessitating a halt in railway enterprise. But electric lighting, water gas, and improvement schemes are responsible for the large total of £2,753,000. The new procedure will be peculiarly appropriate for the smaller towns, the Authorities of which will be encouraged to develop many much-needed schemes of public improvement. The statute empowers the Chairman of Committees in the House of Lords or the Chairman of Ways and Means in the House of Commons to exclude from its operation any provisions of a Provisional Order which are deemed to be of such a character or magnitude, or raise any such questions of policy or principle, that they ought to be dealt with by Private Bill, instead of under the new procedure. Under this power many of the larger undertakings will no doubt be reserved for the consideration of Parliament. But it may happen that what is called an "omnibus" application by a Corporation, containing miscellaneous provisions of a minor character may also have tacked on to it provisions involving important questions of policy or principle, and in that case there is some uncertainty as to how they will be dealt with. It will probably be found possible in such a case to split the less important from the more important provisions, reserving for the former at least the full benefits of the new procedure by local inquiry.

A Japanese University for Women.

THE *British Medical Journal* informs us that steps are being taken for the erection of a University for women in Tokio, which, it is hoped, will be opened in the spring of this year. The fact speaks volumes for the enterprise and progressiveness of the Japanese. There seems to be considerable demand among Japanese young ladies for university instruction, not only in the faculty of medicine—which is hardly surprising—but also in the Polytechnic School, an institution for the training of civil engineers! If Japanese women are about to embark on the latter profession they will set an example to their sisters in the West, and open up a new sphere of activity; but whether the sphere will be thought one suitable for women, or whether the example will be likely to be followed, are questions about which many will have their doubts.

MUNICIPAL ENGINEERING & SURVEYING.

CROSS-TABLE CHAT.

I THINK it is only right to admit considerable improvement has been effected in the matter of erecting guide posts and direction posts in country roads since the establishment of County Councils. There is, however, still room for very radical reform. Why is it that one finds, so commonly, guide posts—which should be painted in a conspicuous colour, and discernible and legible on a dark night — with posts, arms, and letters in dark colours, which neither can be deciphered nor seen immediately after sun-down? Is it not possible for surveyors to exercise a little more intelligent discrimination in regard to the matter, and erect guide posts to serve the purpose for which they are intended? One might assume that they never experienced the annoyance of finding themselves on an unfrequented road in a strange district on a dark night, and groping for a guide post at the junction of two roads. A few experiences of this kind would assuredly inculcate wisdom.

GUIDE posts and arms should always be painted in white or light stone colour, and the letters should be black—if raised letters so much the better—and the painting should be renewed every two years. Cast iron arms, unless screwed on to a backing of wood tenoned into the post, should not be used, as they are always liable to be broken by mischievous youths. The design of the posts and arms in numberless cases is execrable, and the designs, too, of manufacturers of such posts are generally lamentably bad, and consist of hideous arms fixed to ugly cast iron columns, terminating in a stumpy manner a few inches above the arms.

WHAT is really required is a simple uniform system for the position of guide posts with letters of a uniform size and posts of one pattern, and painted, as I have said, in a light colour, which should be prescribed either by County Councils or by statute. Every road junction should have a guide post, on which should be lettered the name of the parish in which it is erected, and the arms should not only indicate the direction of the village to which they refer, but also the nearest important towns and the distances thereto.

THERE are few municipalities, in my opinion, which enter into the spirit of their work *con amore* so much as that of Glasgow. The originality of the Glaswegians in municipal activity is almost proverbial. One of their most recent innovations is the provision of a series of lectures, to be given during the winter months, arranged by the Corporation, and which are to be descriptive of Corporation schemes and work, and which are to be delivered by the heads of Corporation departments. The first lecture was delivered by the treasurer of the water department on November 10th on "Glasgow's Water Supply." Mr. Chamin, the City Electrical Engineer, has lectured on "The Municipal Electric System," and Mr. McColl, the well-known superintendent of cleansing, on "How the City is Cleaned." Whilst other lectures in the course are "Subterranean

Glasgow; or, How the Sewage Reaches the Sea," by Mr. McDonald, the City Engineer; and "The Gas Supply," by Mr. Foulis, the City Gas Engineer. The idea of inducing her citizens to interest themselves in their own government, property, and privileges, is, it appears to me, an eminently good one, and worthy of imitation. Glasgow Councillors are proud of their attainments, and they have reason to be so.

I REFERRED last week to the rapid strides which are being made in the development of lighting by acetylene. My remarks appear to have excited considerable interest, for I have been asked by several readers if I would give some particulars as to the manufacture of the gas. Briefly, I may explain that acetylene is manufactured from calcium carbide, and the latter is a compound of carbon and lime which are mixed together in a finely-ground state, the two substances being fused together in an electric furnace at a very high temperature and converted into calcium carbide, which is then allowed to cool and broken into sizes suitable for distribution and sale. The carbon required for the process is obtained from anthracite coal and coke. Both carbon and lime are comparatively cheap, but the use of the electric furnace is costly, as the horse-power required in connection with it is very great. For this reason, carbide can only be manufactured economically by means of cheap water power, and at the present time all carbide factories are located near waterfalls, and the only one I believe in Great Britain is that belonging to the Acetylene Illuminating Company at the Fall of Foyers, in Scotland, where about 3000 horse-power is utilised.

CARBIDE of Calcium is of two kinds, "ingot" and "run" carbide, the latter being the kind manufactured at Foyers. Each pound of carbide as sold is supposed to yield not less than 5 cubic feet of gas, and the cost per ton is about £16. To obtain generation of gas for portable lamps a special preparation of calcium carbide treated to render it impervious to atmospheric moisture is used, and all that has to be done in this case is to immerse the carbide in water when gas is evolved. As soon as it is withdrawn from water no more gas is evolved, and the carbide in this form remains intact until again immersed. Such lamps are under perfect control, and the moment the tap is turned off generation ceases.

IN installations for villages and institutions the apparatus consists of a generator, usually containing water, into which the carbide is placed, a gasholder and purifier. The whole plant is comparatively simple, is easily manipulated, and there is little danger now attendant in its use. SENEX.

AT the last Torquay Town Council meeting the Town Clerk, and the waterworks engineer, reporting on the question of supplying Teignmouth with water, stated that the supply asked for might be granted, provided the District Council would enter into a formal agreement to take water for thirty years on terms that were stated. The Water Committee recommended that an offer be made to supply Teignmouth with a minimum of 15 million gallons, and a maximum of 25 millions per annum, delivered by meter into a 7in. main, to be laid by the Teignmouth Council for fifteen years at a charge of 1s. 1d. per 1000 gallons, provided that the quantity supplied in any one day shall not exceed 200,000 gallons. In the event of this offer being accepted by Teignmouth, the Town Council will take steps to raise the dam of the Kennick reservoir seven feet, at a cost of £12,000.

National Health Society.

OFFICIAL TRANSACTIONS.

ASSOCIATION OF NATIONAL HEALTH WORKERS.

A GENERAL meeting of the Association was held at 53, Berners-street, at 3 p.m. on Saturday, December 29th. Miss Christine Hall was appointed hon. secretary and hon. treasurer, and Miss Pridham and Miss Draper were elected members of the Committee. A resolution was proposed by Dr. Childs and seconded by Miss Baker to the effect that at meetings of the Executive Committee three members should constitute a quorum, and that nine members should be a quorum at general meetings. After the meeting a paper on "Infant Life Protection" was read by Miss Smith, County Council Inspector under the Infant Life Protection Act, the chair being taken by Dr. Childs in the unavoidable absence of Lady Priestly, who was prevented by illness from being present. There was a good attendance, and an animated discussion followed the lecture, in which Mrs. Westaway, Mrs. Greenwood, Miss Morgan, Miss Allen and Miss Baker took part.

ABOUT fifty guests responded to the invitation of the president, Dr. Childs, and the Committee to the conversazione on the evening of the 29th. Dr. Spitta, aided by his son, kindly supplied the chief entertainment of the evening. By means of a splendid lantern he demonstrated some of the choicest and most recent marvels of micro-photography. Amongst the most interesting slides were the eye of the beetle, showing the thousands of miniature "eyelets" of which it is composed, and, wonderful to relate, a corresponding number of portraits of the demonstrator, each taken through and focussed by an individual "eyelet"; also a transverse section of the retina of the human eye showing distinctly the "rods and cons." Various bacteria and other microscopic parasites were also shown, including the notorious plasmodium malariæ, the cause of malaria. This organism was shown in the various stages in which it invades and develops both in human blood and in the body of the mosquito, which is now very generally regarded as the vehicle of the infectious parasite, the plasmodium. The lantern display was followed by a short and much appreciated musical programme, in which Miss Lydia Lévy, Miss Katherine Martin, and Miss Lillian Hall took part. Miss Lankester received the guests.

CORRESPONDENCE.

(*To the Editor of* THE SANITARY RECORD.)

A CLEAN BILL OF HEALTH.

SIR,—It is an interesting and, I believe, a rare fact for an urban district to be entirely free of infectious disease for a twelvemonth. The past year has given this immunity to the North Wales health resort of Penmaenmawr, and it is all the more noteworthy when coupled with the fact that there was a larger visiting population than in any previous year. The total absence of zymotic mortality here in 1899 directed attention to a remarkably clean bill of health; and much satisfaction is felt locally in having improved upon even that good record. It would be information to know if any of your numerous readers can of their experience or knowledge relate a like condition elsewhere. The resident population here is about 3500, and the Notification Act was adopted soon after it became law.—Yours faithfully, ERNEST WORRALL.

Penmaenmawr, New Year's Day, 1901.

THE EVOLUTION OF THE JERRY-BUILT HOUSE.

In the current issue of *Public Health* Dr. E. Gwyn, Medical Officer of Health for Hampstead, deals with "The Jerry Builder Considered in Relation to the Housing of the Poor." According to Dr. Gwyn the evolution of the jerry-built house appears to be somewhat as follows:—Some green fields, or some mansion with a few acres of pleasure or garden ground, conveniently situated in the suburbs, are advertised to be sold, or let on building leases. Timber is forthwith cut down, roads formed, and sewers built; plans are prepared by which the ground is cut up into plots containing a feet of frontage and a greater number of feet for depth. These plots, if not sold, are let at a ground rent of so many pounds each, the lessee undertaking to put a house of specified value upon it. By these means it is intended that a field, which at the time of letting brings in a few shillings per annum as grazing ground, shall, when covered with houses, bring in as many pounds, and that, moreover, the houses erected thereon shall revert to the ground landlord at the termination of the lease. But to get the houses built something more is needed. The capitalist, often the owner of the land, now comes forward with loans, to enable a class of small builders to undertake the work. These builders, for the most part men with little or no means, but with a certain knowledge and experience, have to build the houses and to support themselves and families during the period in which the loans can be made to last. A surveyor is appointed to protect the advancer of loans, and if he prove faithful to his employer the brick, lime, and timber merchants, and others, will probably suffer by the bankruptcy of the builder. But if the builder is not to fail, it follows that he must go to the cheapest market for his materials. His bricks will be porous, his timber "shaky," his mortar deficient in lime, his plaster destitute of hair, his woodwork and joinery of the most unsatisfactory kind, and his sanitary appliances of the cheapest quality. The drainage, supposed for the most part to have been supervised by the sanitary officials, will often be found to be defective, and although the introduction during the last few years of the water test has recently secured an improvement in this respect, it may be said, without much fear of contradiction, that in a great part of London the jerry builder has been content with clay-jointed drains, which are now leaky.

The houses thus erected will, if possible, be sold, often at a very small margin of profit, in order to obtain a quick return of capital, with a view to further operations, or, failing sale, will be let at a cheap rate to start them. As a result, whatever may have happened to the builder, at least the grand object of the whole transaction, namely, the creation of a valuable ground rent, will have been obtained. It not infrequently happens that an artisan or clerk will be tempted to invest his savings in one of these houses, either for his own occupation or for letting, it may be, by the aid of one or other of the benevolent or building societies. He too often finds, either on the occurrence of illness or upon complaint from a tenant, that after the visit of the Sanitary Inspector he is addled with the costs of re-drainage—a veritable fine, in fact, of £40 or £50, which he is quite unable to meet.

It is said that Madame de Pompadour exclaimed, *Après nous de déluge.* Well might the jerry builder repeat the remark—a deluge, truly, of sanitary notices from the Authorities to repair the original defects in drainage, obviate dampness, &c. More than 50,000 notices for repair to drains and other sanitary matters are annually served for the abatement of nuisances due in a great measure to original defective construction.

A HINT TO SANITARY ASSOCIATIONS.

In regard to Sanitary Associations, of which there are several in existence, the Glasgow *Sanitary Journal* presses the opinion that there is a distinct opening for an Association that will, metaphorically speaking, push its wares. How many citizens, for instance, it asks, "know what the West of Scotland Sanitary Association is, and what are its objects? Why not canvas for orders instead of waiting for orders to come? It is a fundamental principle in business that a new line of business must, in order to succeed, push for all it is worth." These remarks are followed by some capital advice addressed primarily to the association referred to, but sufficiently interesting to be reproduced for the benefit of others. "Let a circular be issued describing in brief the beneficial objects of the Association, and at the end of the circular the information added that for '(say) 5s. a year we shall undertake to test your drains when called upon to do so, or at least once a year. Our Mr. So-so will call upon you in a fortnight to receive your answer, &c.,' or words to that effect. Residents in tenement properties should jump at such an offer, and if the association is willing to undertake the work that will undoubtedly wax into magnitude, much good will result. Indeed, the Public Health Authorities in a few years would remark upon the marvellous decline in infectious diseases. At first blush one is apt to run away with the idea that the association and the statutory Sanitary Inspector will come into conflict. But closer inspection will show that the Sanitary Inspector only interferes when he suspects, or is aware of, the existence of a nuisance. Smoke or other testing by an association would be applied to discover defects. In fact, the association would, in process of time, prove itself to be the Sanitary Inspector's most powerful ally in doing good."

SOAPS: GOOD AND BAD.

By Jerome Walker, M.D.

Soap is one of the most important necessities of modern life. Properly made and properly used, it is a detergent or cleanser, a deodoriser, a disinfectant, and an antiseptic. Improperly made, it is an irritant when applied to the human skin, and if it contains dirty and decomposing fat is a filthy application. It is well recognised by physicians that eruptions on the skin persist and recur with the use of particular kinds of soap. This cannot be wondered at when "spiculæ of bone, pus cells, and fragments of connecting tissue" have been found in certain soaps. Soap fat, or the fat which forms an essential ingredient of soap, by some soap makers and many collectors of it, means any sort of grease. Too often the fat used in soap making is putrefying kitchen refuse, fit perhaps for axle grease, but not for the human skin.

In an article in a recent number of the *Medical News*, entitled "What is the Best Soap to Use in Washing the Scalp?" the author rightly says "many women who make their living by caring for the hair have some mysterious soap which they use, vaunt, and try to sell to their customers, but the composition of which they will not reveal." He then adds, "As a matter of fact, except in a very few conditions of the scalp, it makes little difference what sort of soap is used provided it is made by a good manufacturer." But it does matter very much what sort of soap is used. It is the good soap we want, whatever the character of the manufacturer may be.

Unfortunately the statements of the manufacturers of soap, as well as of other articles, as to the purity and usefulness of the products of their factories, are too frequently unreliable. Such statements made, it may

be, by men considered good, are looked upon as clever. Soaps are in reality salts, stearates, palmitates, and oleates, chemical compounds of water, and fatty acids evolved in the disintegration of fat by heat, with soluble alkalies such as soda, potassa, or borax. Good soap is made of pure and carefully compounded ingredients. There is no decomposed fat, and all, or nearly all, of the fat or oil used is saponified, with no excess of alkali. Soaps attack dirt and render it soluble in water mainly by alkalinity. But there should be irritation of the skin by their use. There should be just enough water to render the soap readily soluble, and no more. There is no admixture of foreign matter, such as talcum, clay, &c., which is commonly present in the cheap toilet soaps. A good soap also has a uniform and permanent colour, and no disagreeable odour. It is not sticky, and when used upon the skin, leaves it clean and soft.

The softness of soap depends to a considerable extent upon the amount of oil in the fat used, but potash soaps are usually softer than soda soaps.

The best toilet and medicinal soaps are made from vegetable oils or fresh fish oils. Their perfuming and colouring require great skill. Perfumes and colouring matter, if not carefully incorporated in soaps, may detract from their detergent properties. It is also a question whether in some of the medicinal soaps, *i.e.*, soaps to which are added medicinal substances for external medicament, the detergent power is not impaired. A pure soap, even without any medicinal substance added, answers well oftentimes as a disinfectant, deodoriser, and antiseptic, though its cleaning powers alone recommend it to most persons.

Borax soap and pure toilet soaps only should be used for infants and children, or adults with delicate skins.

Finally, when we consider that soap is a necessity of modern life, for the laundry, the toilet, as a vehicle for medicinal applications, and for physicians and surgeons in the exercise of their functions, it is especially important that the soap used should be pure, and that the name of the manufacturer should be a synonym for honest goods.—*The Sanitarian.*

THE SMOKE NUISANCE IN CANADIAN CITIES.

Toronto has just completed a costly new city hall, and as it is becoming discoloured by the smoke of a large industrial establishment in its immediate neighbourhood, the City Council has taken up the question of compelling all manufacturers to consume their own smoke. Some twenty years ago Professor Carpenter, the eminent physiologist, visited Toronto, and was then very much surprised that a city of such beauty and such salubrity of climate should be befouled and have the health of its citizens jeopardised by the ever pouring out of these clouds of black smoke from the tall chimneys of the great manufactories of the city. Montreal suffers greatly from the same nuisance, and it is understood that the city fathers of that metropolis are to follow the lead of Toronto in maintaining a purer atmosphere for its citizens. Cape Breton is a part of Canada which is now passing through a period of great development through the energy of the well-known Boston capitalist, Mr. Henry M. Whitney. This gentleman believes that the best way of dealing with this smoke nuisance in a satisfactory manner is to provide smokeles fuel, which he is now doing on a large scale for the city of Boston. He has erected 400 by-product coke ovens in which the coal of Cape Breton is converted into a cheap smokeless fuel. He states that the gas, tar, and ammonia which are saved more than pay for the trouble of converting the coal into coke. When this fact becomes to be generally recognised in Canada, its cities and towns will produce a purer atmosphere for their inhabitants.

REVIEWS.

Theory of Engineering Construction: a Reference Book for Engineers and Students. By Ernest H. Essex, Assoc. M. Inst. C.E. 216 pp. Price 5s. London: The St. Bride's Press, Limited.

This book is really a selection of notes and formulæ on the theory of construction, arranged in the form of answers to the questions set at examinations for the election of associate members of the Institution of Civil Engineers, and embrace answers to fifty-one questions in theoretical and elementary applied mechanics, theory of structures, strength and elasticity of materials, and geodesy. The answers are illustrated by diagrams, and appear to us to have been well and carefully done, and with a preciseness which is commendable. A short syllabus of the subjects of the examination is given. Intending candidates for the examination will find the book of very considerable service. The volume is nicely printed and well got up,

The Law and Practice of Rating both Within and Without the Metropolis. By Walter C. Ryde, of the Inner Temple, Barrister-at-Law. Large 8vo. 756 pages. Price 35s. Shaw and Sons.

For parochial officers, valuers, and lawyers engaged in the practical administration of the rating law there is no book which surpasses or equals the one before us. The book is divided into four parts, Part I. being concerned with the persons liable to be rated, Part II. deals with the measure of liability, Part III. with the different kinds of property, and Part IV. with the practice and procedure outside and within the metropolis. The whole subject is discussed in a thoroughly exhaustive manner, and with a freshness which is exceptional and pleasing, and makes the book of especial value to laymen, such as Assistant Overseers and members of Assessment Committees. It is impossible to peruse the book without being struck with the extreme care which has been exercised by the author in compiling notes of all cases which bear directly or indirectly on the subjects to which the volume is devoted, and numerous cases are reported which we do not appear to have observed elsewhere. This volume will rank as the standard book on the law of rating.

AN INDICTMENT OF SEWER VENTILATION.

An article in the evening *Sun* by Mr. William Brown, with the somewhat sensational heading, "The Public Health Service: Its Disastrous Breakdowns and How to Prevent Them," has come under our notice. We had anticipated some "revelations," but, like the patent medicine advertisements, we only reach the real question at issue, from the writer's point of view, towards the end of the article. In Mr. Brown's opinion, the cause of the periodical failure of our system of sanitary defence is all the result of an error of opinion on an apparently small point. Our street sewers, when properly laid, and provided with openings at intervals for the admission of fresh air, are described as clean running and ventilated, and are assumed to be free from danger to the public. "This," says Mr. Brown, "is false and fatal assumption. Although the sewers may be quite clean running, under the atmospheric conditions just referred to, they cease to be 'ventilated.' The gases of putrefaction then accumulate in the sewers, making the sewer air increasingly foul. This foul air must, by the nature of things, be largely got rid of by the ventilating openings, and, especially if the weather is close and muggy at the time of expulsion, the air which the people have to breathe becomes thereby so deprived of oxidising power that healthy bodily processes cannot be kept up, and the

population soon begins to show the bad effects of this weak air in its vital statistics, the injury to health being in proportion to the continuance of the adverse conditions.

Moreover, it is more frequently the case than is generally supposed, that there is a direct entry of this polluted sewer air into the houses by the house drains. Trapped connections cannot be absolutely relied upon to prevent this entry, and this element of uncertainty applies to the houses of the rich as well as to the poor.

Recognising the position just described, a remedy has been sought by some in a system of high ventilating shafts. The public sense has never favoured this system, and with only too good reason. As has been demonstrated in the technical Press, this system is not only costly and unsightly, but it actually accentuates the evil it is intended to cure. Refutation of this demonstration has been publicly challenged in very pointed terms by a leading technical journal without evoking any reply from those responsible for the adoption and continued use of the system.

Now, seeing that so much of the failure in our sanitary practice is owing to the formation of foul sewer air, it is obvious that the remedy must be sought in some practical means of preventing the air in sewers from ever becoming foul, that is not only under those atmospheric conditions when the means for natural ventilation will prove effective, but also during those changes when natural ventilation must fail. And there is such a means."

STREET REFUSE IN THE CITY OF LONDON.

The Corporation have for some time past been considering the question of dealing with dust and refuse from the City, and, among other things, the practicability of generating electricity from steam raised by burning the refuse. Mr. D. I. Ross, the City Engineer, reporting to them on the subject, states that last year 74,621 loads of refuse were removed from the City to Lett's Wharf, Lambeth, near Blackfriars Bridge, the lease of which expires in 1909. About 60 per cent. of the house and trade refuse is cremated, but the street sweepings, slop, and market refuse are shot into barges and removed daily. The Corporation, having permitted two electric lighting companies to obtain powers to supply electricity for lighting and other purposes, could only generate electricity for their own purposes or for street lighting. They were in a totally different position to other Local Authorities who are supplying electricity in their various districts, and who are cremating their refuse and utilising the power generated therefrom in connection with their electricity works. It was extremely doubtful whether the house and trade refuse could be profitably dealt with by cremation, as it consisted principally of paper, straw, and packing materials of very little calorific value, exceedingly bulky and difficult to manipulate. Although from a sanitary point of view cremation was preferable to any other mode of dealing with the refuse, mature consideration leads Mr. Ross to believe that, having regard to the difficulties of obtaining a suitable site in the City, and the expense thereby entailed, and to the difficulties that would arise in working any apparatus that might be erected without being stopped by legal proceedings, the objections to this course were almost insuperable, and in his opinion it would be better to barge the refuse direct into the country from the City than deal with it there. Mr. A. A. Voysey, the Electrical Engineer of the City, has also made an interesting report to the Corporation on the subject. The Streets Committee, on these reports, have advised the Corporation to barge the dust and refuse into the country, and to obtain some suitable site for the purpose. The question will be decided on the re-assembling of the Corporation after the vacation.

Public Works.

SEWERAGE.

The Local Government Board has at last sanctioned a loan by the Castle Donington Rural District Council of £1680, for the purpose of completing the sewerage and drainage scheme.

The Kingswood Urban District Council's seal has been affixed to the memorandum of agreement with Mr. William Robson for the purchase of land at Cowhorn Hill, Oldland, as a site for the drainage outfall works.

The Finance Committee reports to the Colchester Town Council that it has no objection to the proposals of the Roads and Drainage Committee to borrow £10,000 for the extension of the sewerage outfall works, and a further sum of £9000 for the construction of new main sewers for the sewerage of St. Botolph's Valley and Maldon-road districts.

The Sewerage Committee of West Bromwich Corporation report having considered an exhaustive report of the Borough Surveyor (Mr. A. D. Greatorex) on the bacterial treatment of sewage, and recommend the Council to adopt the scheme set out in the report for dealing with the sewage of the borough, and make application to borrow £15,000 for carrying out the scheme.

At a special meeting of Linlithgow Burgh Commissioners last week the deed of agreement between Mr. Hamilton, West Port, and the Commissioners for the lease of ground for the erection of sewage works for the town on the principle of the septic tank was submitted and revised. A plan of the works was also submitted, and after perusal the meeting authorised the Provost and Bailies Dowie and Beattie to execute the deed on behalf of the Commissioners.

The Derby Corporation intends promoting a Bill during the ensuing session the object of which, among others, will be to extend the boundaries of the borough and to empower the Corporation to construct tramways, additional waterworks, and sewage disposal works, and to effect certain street widenings and improvements. The following borrowing powers are sought by the Corporation:—For tramway purposes, £241,535; for waterworks purposes, £50,962; for sewerage and sewage disposal purposes, £290,000; for street improvements, £24,570; for crematorium, £2500; for conversion of existing closet accommodation into water-carriage system, such sum as may be required; for technical college, £6000; and sums required for compensation purposes and the costs of the Act.

The Special Sub-committee of the Birkenhead Town Council appointed to consider the question of sewer ventilation just recently presented its report. It showed that the fullest consideration had been given to the matter, and the Committee was of opinion that the sewers of the town should be ventilated. It recommended that the ventilation should be provided by up-cast ventilators instead of by surface gratings, and that the necessary alteration be proceeded with in all streets of 30ft. in width and under as soon as practicable. In submitting the report to the Council, Alderman Singleton said that in the narrow confined streets the escape of sewer gas from the surface gratings was very dangerous, but in the other streets it was not so bad. They meant to erect ventilators where they could, provided they got permission. Hitherto they had little difficulty in getting the owners' consent to erect ventilators. They had had many complaints of the surface gratings, and he believed that he was correct in saying that 50 per cent. of the owners had promised. The report was approved.

THE Local Government Board has refused the application of the Skegness Urban District Council for sanction to borrow £1360 for the improvement of the sewage works, on the ground that the arrangements are quite inadequate to deal efficiently with the sewage taken to the outfall.

AT a recent meeting of the Billesdon District Council the Clerk read a letter from the Local Government Board stating that the Board could not advise the Rural District Council as to whether or not it should proceed with the sewerage and water schemes referred to in Mr. Everard's report, and pointing out that the duty of providing each contributory place within the rural district with an effectual drainage and a proper supply of water had been placed upon the Rural District Council and not upon the parish meeting, and that the responsibility, therefore, attached to the Council would not be affected by the attitude of the parishioners. If the Rural District Council adopted schemes of water supply and sewerage and sewage disposal, and applied to the Board for sanction to loans to defray the cost the Board would be prepared to consider the application, and would probably direct the holding of a local inquiry before coming to a decision. Mr. Sharpe said it was generally admitted that something would have to be done in the matter of sewerage, and on this motion, which was seconded, it was decided that some sort of scheme should be adopted, and that the Committee should confer with Mr. Everard as to the cheapest manner of providing a proper scheme.

A FURTHER step, and one which it is hoped will mark the completion of the work of establishing a thorough system of drainage and sewage disposal for the borough of Shrewsbury, was taken last week, when the Mayoress, in the presence of a large and representative company, formally opened the door of the new pumping station at the sewerage works in Coleham and set the machinery in motion. The engineers of the scheme, which is now nearing completion, are Messrs. John Taylor, Sons, and Santo Crimp, of Westminster. The scheme, which is known as the main drainage works, was begun about four years ago. It comprises a complete system of sewers for intercepting the sewage, which at present discharges into the Severn. The sewage for the most part is conveyed to the pumping station by large iron sewers; at the pumping station it is pumped by means of a pair of compound beam-pumping engines into a gravitation sewer of brick, about a mile and a-half in length. From this it is discharged on to the land purchased by the Corporation at Monkmoor. There it will clarify, the solids will be pressed into innocuous cakes of manure, and the inoffensive liquid will be spread over the land. It is not claimed by the engineers that they are introducing into the works anything of an unusual character; they have worked on old-fashioned principles, modernised and brought up to date as regards details. The cost of the scheme is not at present known, but it will probably come near £100,000, of which about £22,000 represents the purchase money of the land.

WATER.

AT a recent meeting of the Pershore District Council, Mr. Caink, the Worcester City Engineer, wrote that with regard to the proposal to supply Pershore with water from Worcester, there were no engineering difficulties in the way. The city of Worcester would deliver water to the city boundary at 9d. per thousand gallons, and he suggested that a reservoir should be constructed at Allesborough Hill holding about 250,000 gallons for the supply of Pershore. The proposed works were estimated to cost £8864, and these works would include the cost of snpplying Whittington and also a supply for Pinvin. The estimate was referred to a Committee.

LYDFORD village new water supply works have been passed by Mr. Bellamy, C.E., and there are now hopes that Lydford will steadily develop as a moorland holiday resort. The castle ruins and the waterfall and gorge on the one side, and Dartmoor, with its dales, rivers, and tors, on the other, are permanent attractions. Several new residences are to be built forthwith.

AT the last meeting of the Menston Parish Council, the chairman reported that the Menston Waterworks Company claimed £20,000 as the price of their works, and that they had appointed Mr. Gott as their arbitrator, and Mr. Woodhead was to be their principal witness. It was stated that the Wharfedale Rural District Council, which is purchasing the works, has appointed Mr. Fawcett as its arbitrator, and Mr. Silcox will be the principal witness.

A SPECIAL meeting of the Wolverhampton Town Council was held in the Council Chamber, last week, "to take into consideration, and determine upon, the expediency of promoting, in the next session of Parliament" a new Bill "to authorise the Corporation to construct additional waterworks, and to raise further money for the purposes of their water undertaking, to extend its limits for the supply of water, and to make further provisions in regard to the water undertaking of the Corporation and other purposes." Among the provisions of the proposed Bill were provisions for borrowing a sum of £39,740 in addition to the amount already borrowed.

IN view of the provisional order which the Corporation of Irvine is promoting in Parliament for power to acquire an additional catchment area for the waterworks, deputations from the Burgh Commissioners of Saltcoats, Stevenston Sub-committee of the County Council, Joint-committee for Kilwinning Water Supply District, and Nobel's Dynamite Company met the Corporation of Irvine last week. All these places derive their supplies from the Irvine reservoir. Objection was taken to the order on the ground that no provision was made in the agreement with the authorities to substitute a different supply; that Irvine was not entitled to draft on to the Burgh Act of 1881 new provisions for which parliamentary powers are necessary, nor to subject to outside local authorities outside the agreement. Mr. James Campbell, solicitor, Saltcoats, appeared for the outside authorities, and spoke at length. He referred to the priority clause in the Act of 1881 as being the principal bone of contention. If that clause was not deleted the outside authorities would oppose the order. Provost Murchland replied to the objections, and the deputations withdrew.

THE Salford Corporation Bill, which has been deposited for next session, deals exclusively with the future water supply to that borough. The preamble, which covers five pages of the Bill, sets out the circumstances and parliamentary enactments under which the Corporation become entitled to a supply of water in bulk from the Manchester Corporation up to a limit "not exceeding 2,000,000 gallons a day at a price not exceeding 3d. per 1000 gallons, as an arbitrator to be appointed by the Board of Trade should appoint." The operative clause in the Bill, carrying out the recitals of the preamble, proposes to enact that the Corporation, by giving three months' notice, may require the Manchester Corporation to supply to Salford "such daily quantity of water over and above the daily quantity of 2,000,000 gallons as the Corporation in such notice state that they require for the township of Salford." The remaining clauses in the Bill empower the two corporations to borrow "such sums as may be necessary, and as the Local Government Board may sanction" for carrying into execution any agreements that may be entered into under this Act, provided that the aggregate amount which may be borrowed shall not exceed £50,000.

The Waterworks Committee recently reported to the Lincoln County Council that the Local Government Board had sanctioned the borrowing of £13,500 for ten years for boring for water, with a promise to extend the time for repayment if the works prove successful, and the Committee had instructed their engineer to invite tenders. The Board deferred consideration of the application to borrow a further £2500 for sinking the well until the boring works have been completed. The Chairman of the Committee stated that they were not now taking water from the river Witham, so there need be no anxiety about the drinking water being polluted by the sewage effluent from Bracebridge County Asylum which was discharged into the river. The discoloration of the drinking water had been caused by the recent heavy rains, and the Committee were now enlarging their filter beds.

At a recent meeting of the Grays Urban Council a letter was read from Romford Urban Council inviting delegates to meet an Executive Committee of Council concerned to discuss the question of the heavy costs and charges in connection with the recent Water Trust proceedings. The Chairman said the Executive Committee satisfied themselves that the charges of Parliamentary agents, which appeared to be those which were strongly objected to in certain quarters, were exceedingly moderate. The total amount of the Bill, for the proceedings at both parliamentary sessions, was £18,000. The Romford Council was apparently now desirous of going behind the backs of the Executive Committee, and to have it all thrashed out by other persons who had not been in close and intimate touch with the whole of the proceedings, as had those who had given a great deal of time and attention to the whole of the work from beginning to end. Mr. E. W. Brooks moved that the Clerk should reply stating that the Council did not see its way clear to do as requested by Romford. The Chairman said in round figures the capitalised value of the concession obtained was certainly from £130,000 to £140,000 over the districts on the present values, and it had cost the districts less than £20,000 to get them. Mr. E. W. Brooks' form of reply was agreed to.

LIGHTING.

A Local Government Board inquiry was held at Ripon last week into the application of the Town Council for sanction to a loan of £7000 for extension to the gasworks.

At a recent meeting of the Electricity Committee of the Bradford Corporation, it was resolved that the consideration of the charges to the Tramways Committee for the supply of electricity should be deferred until the end of the financial year in March.

The Felixstowe District Council has adopted the recommendation of the General Purposes Committee, that Sir William Preece be asked to report to the Council the best course, in the interest of the ratepayers, to adopt with respect to the Council's Electric Lighting Order. Sir William Preece's fee will be fifty guineas.

The Bill to confer further powers upon the Chester United Gas Company has been duly deposited for next session in the Private Bill-office of the House of Commons. By this Bill the company seek powers to acquire additional lands adjoining their existing works "for the manufacture and storage of gas and of residual products." These lands, which must be acquired within the next three years, cover an area of 11,432 square yards, but by agreement the company ask for power to purchase a further five acres, upon which, however, the manufacture of gas and residual products is prohibited.

The Dover Gas Company directors have convened a meeting of their shareholders to confirm their authority to apply to Parliament for the powers which are necessary to extend their works to meet the growing necessities of the town.

A deputation attended the last meeting of the Blaydon Urban District Council asking the Council not to oppose the application which would shortly be made by the Newcastle Electric Light Company for a licence for the extension of power, so that they could supply Blaydon and Royton if necessary. The Council, however, before coming to any decision on the matter wished to be supplied with details by the company.

The Town Clerk recently intimated to the Dublin Council that notice had been given on behalf of the Blackrock Urban District Council of the intention of that body to apply for a Provisional Order authorising it to produce, store, supply, sell, and distribute electricity for public and private purposes within its district. The Town Clerk and Law Agent were directed to take the necessary steps to protect the interests of the Corporation.

Mr. W. A. Ducat held an inquiry on behalf of the Local Government Board at West Bromwich last Friday into the application made by the Town Council for sanction to borrow £5524 for the purposes of their gas undertaking. It was explained by Mr. Caddick, Town Clerk, that the application was brought about by the the rapid increase in the demand for gas during the past few years. The Council proposed to spend £5524 in the construction of a new siding and a bridge over the canal and also in laying down additional plant. The Inspector afterwards visited the gasworks.

One of the Liverpool papers, devoted to the supervision of the gas world in its various bearings, mentions that Dr. Ludwig Mond, of Messrs. Brunner and Mond, has invented a process for the production of fuel gas from a cheap form of bituminous coal or slack, and that a Bill will be introduced into the next session for supplying a large district of the Midlands with the new agent. The price will not exceed, and may even be less than, 3d. and 4d. per 1000ft., according to the quantity taken per quarter; but in any circumstances 4d. is to be the maximum price. The gas will be called, after its inventor, the Mond gas, and it seems that the area in the Midlands to be thus supplied under the Bill is very large.

The lighting of Bognor was discussed last week at a meeting of the Urban Council. An offer was made by the gas company, as an experiment, to fit up a dozen lamps with incandescent burners in the principal thoroughfares, to bear the expenses of up-keep, including lighting and extinguishing, for six months, the Council to pay for the gas consumed, and at the end of that period take over the lamps and burners at net cost if satisfied with the results. The present lamps were said to be of 15 candle-power, but only a 10 candle-power illumination could be obtained; and the new lights were of 80 candle-power, and would cost only about £24. The Council decided to accept the offer, excepting the clause binding it to take the lights over should they be satisfactory.

GENERAL.

The Paddington Borough Council is to be asked at its next meeting to appoint a committee to devise some improvements of the workmen's dwellings within the borough, particularly those near the dustyards.

Having failed, and properly so, to obtain any suitable applications for the position of Ham Green Hospital Medical Officer, at a salary of £100 per year, the Bristol City Council has resolved to issue a further advertisement offering a salary not exceeding £200 per annum.

A Northampton patient has died from whooping-cough at the age of seventy-seven.

The Taunton Town Council contemplate establishing a Horsfall refuse destructor for the borough.

The Islington Borough Council has expressed its approval of the housing scheme of the London County Council at Wedmore-street, Upper Holloway.

The Marsden Urban District Council, when it has received the sanction of the Local Government Board to the loan, will require a new steam road roller and scarifier.

The original office of *Household Words*, in which Dickens made the acquaintance of Mr. John Hollingshead and many other celebrities, is doomed to destruction under the Holborn-Strand scheme.

A Local Government Board inquiry was held last week at Bury into the Corporation's application to borrow £15,000 for market undertakings, and £20,000 for slaughter-houses, refrigerators, ice-making apparatus, &c.

A Local Government Board inquiry has been held at Croydon by Colonel Durnford, R.E., with reference to the application of the Croydon County Council to borrow £2250 for kerbing and paving in North End, and £520 for a new sewer at South Norwood.

The Kingston-upon-Hull Corporation Bill, which has been deposited in the Private Bill-office of the House of Commons, will enable the Corporation to raise for the execution of street works, £560,000; for the construction of the new bridge, £36,000; for tramways, £27,000; and for purchase of land at Cottingham and waterworks, £33,000.

The Colchester Town Council has had before it a scheme for the extension of the sewerage outfall works, the construction of filter beds, the provision of additional sludge plant, and the construction of new main sewers in the St. Botolph's Valley and Malden-road districts, the estimated total cost being £19,000. The discussion on the subject was adjourned for a month.

At the last monthly meeting of the Elland District Council it was decided to invite tenders for the erection of a refuse destructor at the sewage works. A letter was read from the Halifax Rural District Council asking the Elland Council on what terms it would take into its sewers and treat the sewage from the houses at Fixby. It was resolved that the Rural Council be informed that at present the Elland Council could not comply with the request. The Clerk was instructed to advertise for tenders for the erection of public baths, as soon as the sanction of the Local Government Board was obtained.

Giving evidence at a Local Government Board inquiry last week, the Town Clerk of Liverpool told of what the City Council was doing to improve the condition of the people. One hundred and eighty-two houses, with recreation grounds, were in course of erection by the Corporation in Dryden-street and Rachael-street. The money for these houses was sanctioned in three portions by the Local Government Board. On July 25th, 1899, £13,500; on November 8th, 1899, £13,100; and on May 12th, 1900, sanction was given for the borrowing of £1400 for the supply of hot water. There had also been the sum of £30,000 sanctioned within the last few days for erecting ninety-five houses in the Kempston-street area and the Fontenoy-street area, and there was an application now before the Board by the Council for permission to borrow £53,500 to build 208 houses in Kew-street and Newsham-street, in Clive-street and Shelley-street, and in Arley-street. The Corporation also acquired some land under the 16th presentment in Adlington-street and neighbourhood which would provide for 221 houses. They had also acquired in Gildart's-gardens a site for the erection of 137 houses, bringing the total up to 843.

The Leighton Buzzard District Council has decided to make application to the Local Government Board for sanction to borrow £1500 for purposes of town improvement.

A tender for the erection of two underground conveniences on the Grand Parade, Eastbourne, for the sum of £2827, by Messrs. Finch and Co., is recommended to the Eastbourne Town Council for acceptance. This was not the lowest tender.

This is what the local *Star* says of the condition of Montreal:—"Our roads are bad, and it doesn't make a great deal of difference if they should be a little worse. Jolting over them helps the liver. Our parks are beautiful, and it will not add much to our pleasure to have them more so, as it would not be a serious matter if they were a little less so. The lighting of the city is fair. Nobody is going to be a great gainer by having more illumination, or a great loser by getting less of it, but the health of the grown people who pay taxes, the boys and girls who are growing up to be taxed, the toddling babes and the helpless infants; the very life of these depends to a great extent upon the Health Committee's work and the Water Committee's work. Pure water, pure milk, pure food, good drainage, these things come right into our homes, and when our little ones contract fevers from the ill conditions that come from civic neglect, to have to send them away from our homes to lie for weeks in a badly-fitted hospital is too much to ask the citizens to bear."

PERSONAL.

Mr. G. W. Hewes has been appointed Inspector of Nuisances for Burnley.

Mr. H. Jevons, of Swansea, has been appointed Town Clerk for Wigan.

Dr. D. L. Thomas has been appointed Borough Medical Officer for Stepney.

Dr. D. B. Todd has been appointed Public Vaccinator for the rural district of Westbury.

The salary of Dr. Dingle, Medical Officer for Middlesbrough, has been increased to £400 per annum.

Mr. H. W. Longden, of Isleworth, has been appointed Surveyor for the urban district of Penge.

Mr. J. P. Evans has been reappointed Sanitary Inspector for Beeston at a salary of £120 per annum.

Mr. W. F. H. Creben has been appointed Engineering Assistant to the Derwent Valley Water Board, at a salary of £250 a year.

Dr. Broadbent has been appointed Medical Officer for the Newark rural district for the ensuing three years, at a salary of £50 per annum.

The Torquay Town Council has paid the Sanitary Inspector, Mr. Pope, two months' salary, and has decided to dispense with his services.

Mr. M'Caa, Assistant Sanitary Inspector, Perth, has been appointed Sanitary Inspector for the borough of Irvine, at a salary of £100 per annum.

Dr. Brown has been appointed Medical Officer for the Diss district, under the Depwade Board of Guardians, subject to the approval of the Local Government Board.

It is stated that the new electrical adviser to the Manchester Corporation is Professor A. B. W. Kennedy, of London. The payment of £15,000 is to be made for his services.

Mr. F. E. P. Edwards, A.R.I.B.A., one of the chief assistants engaged in the City Architect's Department at Liverpool, has been appointed City Architect for Bradford, at a salary of £400 per annum.

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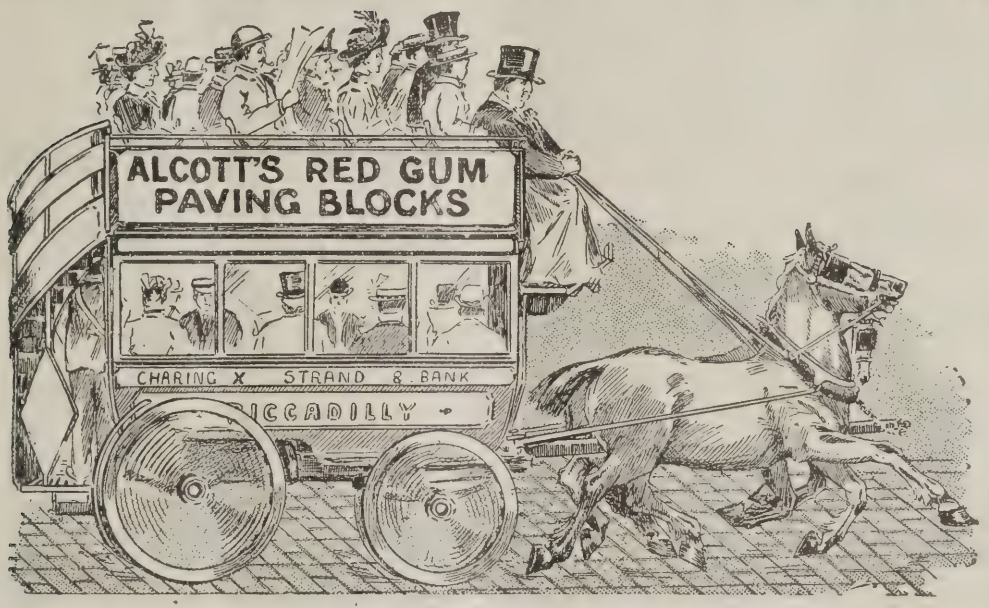

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LONDON, S.W.

THE Local Government Board has sanctioned the re-appointment of Dr. Boustead as Medical Officer for the rural district of Hexham, for one year, at a salary of £210 per annum.

MR. ALFRED MILLS, Assoc. San. Inst., Sanitary Inspector of the Borough of Bethnal Green, has been appointed Building Inspector to the Hornsey Urban District Council.

THE Richmond Medical Officer of Health (Dr. J. P. Rowlands) fell from an omnibus at East Molesey on Saturday week last, and he died on the following Monday morning. He was in his seventieth year, and had been Medical Officer under the Richmond Town Council and its predecessor—the vestry—since 1872.

MR. JOHN BRIGGS, chairman of the Stainland District Council, died suddenly at the railway station, West Vale, Yorkshire, on Saturday last. He was on his way to Halifax to attend the police-court, when in consequence of hurrying he was taken ill, and expired. He was fifty-four years of age, and a Liberal in politics.

NOTES AND QUERIES.

Subscribers may obtain advice on matters appertaining to Public Health Law and Municipal and Sanitary Engineering. Letters should be addressed "Notes and Queries," THE SANITARY RECORD, 5, Fetter-lane, London, E.C. If an answer be required immediately, a stamped addressed envelope must be enclosed

2064. — BACTERIAL AND BIOLOGICAL PURIFICATION OF SEWAGE.—"J. B." writes:—"Will you be good enough to describe the difference between bacterial filtration and biological means of purifying sewage?"

Answer.—The terms biological and bacterial purification of sewage are now indiscriminately used to describe the method of purifying sewage by the aid of minute organisms which are present in the sewage itself, and which by the construction of (1) special forms of tanks, or (2) artificial beds or filters termed bacteria beds are cultivated under favourable conditions, so as to secure their activity and agency in converting the solids in sewage into ammonia, hydrogen, &c. Roughly speaking, there are two systems of bacterial or biological purification, viz., (1) the septic tank or Exeter system, where the sewage is run directly into a tank without any preliminary treatment, and where anaërobic organisms act upon the sewage and liquefy the organic solids and prepare it for further treatment in a bacteria bed or beds, where aërobic organisms effect further purification termed oxidation or nitrification; (2) the Sutton or double contact system, where the sewage is run either directly, or after passing through a detritus tank, into two beds, the first termed a coarse-grain bed, constructed of clinker or ballast of a gauge of not less than $\frac{3}{4}$in., the effluent from which is passed upon another bed termed a fine-grain bed composed of coke breeze, ashes, fine ballast, or sand of a gauge of $\frac{3}{16}$in., the effluent being sufficiently pure to discharge into a stream. In both these systems the sewage is locked in the beds for a period of about two hours.

2065.—SANITARY INSPECTOR: WHETHER PRESCRIBED AGE LIMIT FOR RETIREMENT.—"T. S. H." writes:—"Will you advise as to whether there is any age limit at which a Sanitary Inspector shall relinquish his office?"

Answer.—No. There is no limit prescribed either by statute or order in regard to the office of a Sanitary Inspector or other public health official as to the age at which he shall retire.

2066.—BUILDING BYE-LAWS: DISAPPROVAL OF PLANS: NOTICE AS TO.—"Surprise" writes:—"The enclosed plans have been before a certain Urban District Council and disapproved, the only reason for such disapproval being as stated in a letter written by the Surveyor, 'because they do not comply with the bye-laws in force in the district.' I shall be glad if you will give me your opinion (1) As to whether the above letter is a sufficient notice under the Public Health Act, 1875; (2) whether the plans are in accordance with the enclosed bye-laws, which are similar to those in force in the said district; and (3) if the parties would be justified in erecting the building?"

Answer.—(1) The notice referred to is sufficient. Sec. 158 of the Act of 1875, which applies, only prescribes that "the Authority shall signify in writing their approval or disapproval of the intended work," and the Section has been complied with. It is a general practice, however, with Local Authorities to signify in what respect the plans do not comply with the bye-laws, though this is not obligatory. (2) The plans are not in accordance with the bye-laws. There is, *inter alia*, no open space at the rear exclusively belonging to each dwelling, a most important omission, and one which no Local Authority could justify. (3) No. If the owner proceeds with the building the Local Authority may pull down the same and recover the cost of so doing from him, and they may also proceed for penalties for contravening the bye-laws.

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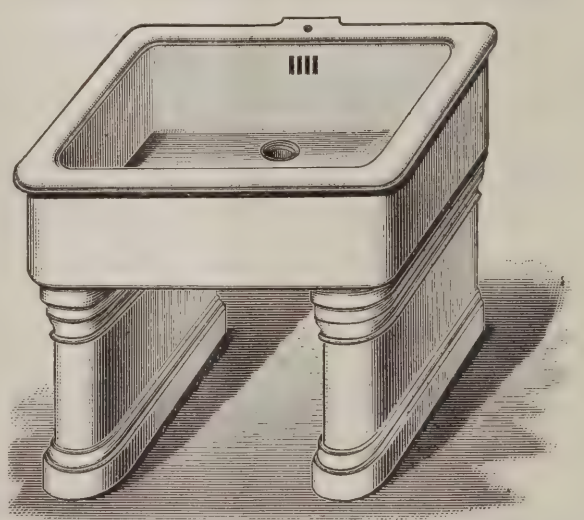

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THE VENTILATION OF SEWERS.*

By H. Gilbert Whyatt, A.M.I.C.E., Mem. San. Inst., Borough Engineer, Grimsby.

The law upon the subject.—The Public Health Act, 1875, contains the following section, No. 19:—"Every Local Authority shall cause the sewers belonging to them to be constructed, covered, ventilated, and kept so as not to be a nuisance or injurious to health, and to be properly cleansed and emptied."

It will be seen that this includes not only ventilation, but the keeping of them in such a condition as that they shall "not be a nuisance or injurious to health," and it will be seen, upon full consideration of the question, that the condition of the air in the sewers depends in great measure upon their construction, condition, and cleanliness.

Variation in the flow of sewage.—Previous to the erection of the pumping station in Riby-street, the sewers were tide-locked twice each day, and the sewage was backed up in the sewers by the rising tide, and held there for seven or eight hours out of the twelve. This rising of the tide, of course, forced all the air out of the sewers through such openings as existed, and thus twice each day the whole of the aërial contents of the sewers was forced up into the streets and curtilages of the houses.

Since the opening of the pumping station this action of the tide has been averted, and the pumps, under ordinary circumstances, keep the water down to an average level; but during heavy rain storms the pumps are not able to deal with the whole flow, and, consequently, in times of storm, the air is still forced out in large quantities. This follows the "line of least resistance," and where the sewer manholes are constructed with closed covers the air forces its way through the traps of gullies, &c. In several cases (see Appendix No. 2) the pressure has been so great as to absolutely lift up the manhole cover and frame and surrounding pavement, and carry it a distance of a few yards. The variation between the day and night flow of sewage also always causes a "breathing" or in-and-out movement of the air.

The air in sewers.—The London County Council, in 1893, instructed one of their chemists, Mr. J. Parry Laws, F.I.C., to make investigations into the air in sewers under various conditions and circumstances, and his observations proved that the micro-organisms in the air of sewers are related to the micro-organisms in the external air, and not to those in the sewage itself; and hence, however full the sewage is of disease germs, they do not pass into the air of sewers in the absence of violent splashing, nor yet when considerable air currents prevail in the sewer. Mr. Laws, also by experiment, found that no micro-organisms were disseminated in the sewer air from the walls of a pipe sewer which had been empty for twelve days, and where immense numbers of microbes must have been clinging to the sides.

Many medical scientists have proved to their own satisfaction that sewer air is incapable of disseminating the germs of disease, but it is certain that more diseases are now popularly supposed to be traceable to sewer gases than was the case some years ago. It is almost certain, too, that those who live in houses to which sewer gas has access are much more liable to infection from zymotic diseases than those who live in pure atmosphere; whilst, on the other hand, the men whose work occupies them several hours each day in and about sewers seldom acquire any of these diseases.

Mr. J. Parry Laws admits the injurious effects of sewer gas in a later report, when he says:—"Although one is led almost irresistibly to the conclusion that the organisms found in sewer air probably do not constitute any source of danger, it is impossible to ignore the evidence, though it be only circumstantial, that sewer air in some instances has had some casual relation to zymotic disease. It is quite conceivable, though at present no evidence is forthcoming, that the danger of sewer air causing disease is an indirect one; it may contain some highly poisonous chemical substance, possibly of any alkaloidal nature, which, though present in but minute quantities, may nevertheless produce in conjunction with the large excess of carbonic acid, a profound effect upon the general vitality."

In my opinion, where there are frequent alterations of level in the flow of sewage, and strong currents of air, it is possible for disease germs deposited upon the sides of the sewers to pass into the sewer air through evaporation.

Many municipal engineers and Medical Officers of Health blame the intercepting trap for the increase in the quantity and foulness of sewer air. Some go even so far as to advocate its omission altogether. The chief point raised by them is that the trap is never adequately flushed out, and that decomposable matters remaining in the trap putrefy before they reach the sewer. The smell of fresh sewage is not particularly offensive, and it is only as putrefaction or secondary decomposition set in that foul odours arise. This occurring in hundreds of instances makes the sewage very much more foul than it otherwise would be, and its emanations more malodorous.

Intercepting trap on house drains.—The intercepting trap was a "fad" on the part of a certain Medical Officer, who was consulted by the Local Government Board in the preparation of their Model Bye-Laws in 1876; whilst being correct in theory, it has many drawbacks in practice, and has tended to obstruct the ventilation of sewers through the house drains. This will be adverted to in a later paragraph.

The Model Bye-Law says that there shall be one trap to each house, with an inlet on the house side of the trap, and a tall shaft from the upper end of the drain.

This has been found to be so great an objection that in many towns they do not insist upon a trap at all, except where the drain runs beneath the house (amongst these towns may be mentioned Leicester, Barrow-in-Furness, Halifax, Stoke-on-Trent, Lewisham, Peterborough, and other places); whilst in the majority of towns in England where the Model Bye-Laws have been adopted, the Local Authority only insists upon one trap to each block of houses, this being the practice at Grimsby.

Owing to the small quantity and irregular flow of sewage from a small block of houses, putrescible matters are always left in the trap, sometimes for several hours, to be partly carried away by the next flush. Where more solid matters find their way into the drains these are washed along into the trap, there subside, and the trap becomes choked.

It has also been found in Grimsby that many drains from properties enter the sewers at so low a level that the junction is submerged, and when the sewage rises above its ordinary level, the air in the length of pipe between the intercepting trap and the sewer becomes compressed, and prevents a flow of sewage through the trap. I shall return to this in a later paragraph.

On account of this frequent blocking of the traps and the obstruction to the ventilation of sewers many municipal engineers desire to do without them, and, as I have already mentioned, some Local Authorities have ceased to use them. In view, however, of the probability of defects existing in the house drains, I do not recommend that the intercepting trap should be abandoned.

Surface ventilation.—When sewers were first generally constructed, from forty to fifty years ago, no ventilation was thought of, though, as there were no intercepting traps, the sewers were always ventilated through the tributary pipes. With the advent of the intercepting

* Report to Special Sub-committee of the Council, county borough of Grimsby.

trap the majority of these outlets were cut off, and manholes with ventilating covers were constructed on the recommendation of Sir Robert Rawlinson, the Chief Engineering Expert of the Local Government Board.

He suggested that manholes should be constructed at not more than 100 yards apart, and it is recounted that, on one occasion, having acted as advising engineer to a certain municipality, they sent to him a deputation complaining of the foul smells from manholes, and asking further advice. He replied tersely, "Put some more in."

I find from the replies to your queries, and from the reports of other municipal engineers, that the majority of towns have adopted surface ventilation, and that in the majority of them it has not been so successful as was hoped.

The Borough Engineer of Leicester, Mr. E. G. Mawbey, M. Inst. C.E., says:—"The system of surface grid ventilation has been well tried in Leicester under all conditions, including those most favourable to it, with the result that it has been found a fruitful source of nuisance by reason of the offensive emanations; and strenuous complaints from the public are very common, and of frequent occurrence. This has also been the case in the wide streets of new building estates, where the open grids have been placed throughout at short distances apart, with excellent sewers of the best type which have been regularly flushed. Pipe shafts have been erected at short distances from the grids complained of, and some of the grids left open, but these grids still acted frequently as offensive outlets, which has been proved by the many anemometer tests taken, as well as by the stench arising therefrom. Finally, these grids have had to be closed, which proved the fallacy of the idea, that, with a combination of open grids and tall shafts, the grids may be relied on to act as inlets only."

In Grimsby I find there are 446 manholes with ventilating covers, and that from time to time the majority of these have been complained about quite as strenuously as has been done at Leicester. In many cases orders have been given for the manhole covers to be plugged or stopped, so as to prevent the foul odours passing through.

The policy of closing the manhole covers without providing other means of egress for the foul air only results in greater offensiveness in the adjacent manholes, with the risk of forcing the foul air through the traps in the near neighbourhood, and producing a similar nuisance in a more confined situation.

Many attempts have been made to filter the air as it passes up the manhole, either through trays of charcoal or sheets of felt, and in other ways, but they have, without exception, been failures.

An effective method of deodorisation is by arranging chemicals so as to have a continual flow of chemicals into the sewer air (the most modern of these being the "Reevozone," where two chemicals flowing out of separate jars come in contact, and form an excellent disinfectant), but these methods are so expensive that no Local Authority is likely to maintain them for any lengthened period.

The theory of sewer ventilation.—The theory of ventilation in a room is a continuous inflow of fresh air, so arranged as not to produce a draught, and a constant outflow of foul and exhausted air. In the ventilation of a sewer the objection to a draught does not obtain, and all that is necessary is to induce a continual flow of air. It is alleged that this can be obtained by the following means (and this theory has been officially approved by the Local Government Board), viz., by fixing an inlet at or near the surface of the ground at the lower end of the sewer, and fixing a tall shaft at the other, or upper end of the sewer; the current of air will always be downward through the surface ventilator, and upwards in the tall shaft. This has not been borne out in practice, although it must be admitted that in the majority of cases the theory is correct; yet the number of cases when the current is down the tall shaft and up at the surface ventilator is so great as to prove that there is no rule. The direction of the flow of air is affected by the direction of the wind, the flow of sewage, the gradient of the sewer, reverse currents of air caused by surrounding buildings and other circumstances.

The direction of the flow of air in sewers.—It is generally supposed that the flow of air in a sewer is in the opposite direction to the flow of sewage, but this again is not found to be always the case, although it is true in a preponderating number of cases. The number of exceptions is so very large as to show the inadvisability of depending upon surface openings always acting as inlets, and tall shafts always acting as outlets, even when the tall shaft is fixed at the highest point of the sewer, and the inlet at the lower end of the sewer.

Vent v. *ventilation.*—The passage of large quantities of air through the sewers, whilst tending to keep the sewers sweet, is not an unmixed blessing, inasmuch as it means that large quantities of foul air are passing out from the sewer in one place or another; it also has the effect of evaporating large quantities of the foul liquids flowing along the sewers, as well as the moisture in those matters adhering to the sides of the sewers.

In my opinion, the ventilation of sewers is not desirable, except on those occasions where workmen have to descend for certain purposes. In this case, the opening of manhole covers in the neighbourhood for some period of time before the workmen descend will ventilate that portion of the sewer, and the men may descend with safety.

It will be recognised that according to the quantity of sewage flowing at different periods, there are different quantities of air in the sewer at different times; and that when the sewage is increasing in bulk, or rising in the sewer, the action of all the inlets is stopped, and under certain circumstances every opening to a sewer, whether at the surface or at a height above the ground, becomes an outlet. I am of opinion that a current of air along a sewer is not a necessity, and that what is required is a free vent for sewer air.

In summer also the air in the sewer is cooler, and consequently heavier, than the external atmosphere, and it will be seen how improbable it is that warmer air will flow down through the surface ventilator in order to push cold, heavy, foul air up a tall shaft.

The direction of the current in a ventilator (whether surface or shaft) is chiefly affected by the wind, either (*a*) by direct impingement into the opening, or (*b*) by indirect action in blowing across the opening. It has already been stated that the opening at the lower level is not always the inlet, and the opening at the upper level is not always the outlet, but that the direction of the current is governed by the direction of the wind. Therefore if all the vent openings are placed at the high level, the sewer gas will be discharged in such a position that it cannot harm anybody.

(*To be continued.*)

THE St. Bride's Press, Limited, 24, Bride-lane, London, E.C., is about to publish, from its works, 13, New Street-hill, Shoe-lane, Fleet-street, London, E.C., a book, entitled "How to Become a Municipal Engineer," by Mr. J. Freebairn Stow, Civil Engineer, Member of the Incorporated Association of Municipal and County Engineers, Member of the Society of Engineers, &c. The author is engineer and surveyor to the Uxbridge Rural District Council, and was previously in the employ of the Public Works Department, Cape Colony. He has endeavoured to place before those about to embark in the profession of civil engineer, or, more properly speaking, that branch of the profession which is known as "municipal engineering," the duties and responsibilities which an engineering pupil must undertake during his term of apprenticeship. The work is believed to be the first of its kind, and is written in as practical language as possible. It will be on sale at 1s. net.

INCORPORATED SOCIETY OF MEDICAL OFFICERS OF HEALTH.

THE HOUSING PROBLEM IN RURAL DISTRICTS.

A GENERAL meeting of the members of the Incorporated Society of Medical Officers of Health was held on Friday evening at 197, High Holborn, W.C. Dr. J. C. McVail, president, occupied the chair, and among those present were Drs. J. T. C. Nash, E. S. Hoare, J. Scott Tew, E. Seaton, W. H. Symons, W. R. Hunter, P. Bangay, Shirley Murphy, A. Newsholme, A. Richards, H. C. Jones, G. Reid, C. E. Paget, E. F. Willoughby, J. H. Beale Collins, O. Field, J. McCathill, and F. J. Allan, hon. secretary. Hearty congratulations were tendered to Dr. McVail upon his recovery from a long and tedious illness.

Dr. C. E. PAGET, M.R.C.S., D.P.H., Medical Officer of Health for the County of Northampton, read an interesting paper upon "Some of the Principles Involved in Schemes for the Better Housing of Rural Populations." He pointed out that the housing question presented features of complexity and difficulty hardly equalled by other social problems. It was a question which could not be considered as affecting towns and urban centres, but also purely agricultural districts. The underlying fact was to be found in the ebb and flow of commercial prosperity. For instance, those working in large towns were familiar with the substitution of large business premises for dwelling houses, the poor being gradually squeezed into more restricted areas; there was the flow of rural population into urban districts increasing the inevitable competition for rooms and sending rents up still higher. Various schemes for dealing with the problem had engaged the attention of Municipal Authorities for years. They, as well as philanthropists, had worked in the direction of erecting model dwellings on the flat system; on the whole this had been found to be a satisfactory system, even if it were only partial in its ameliorative operation. Many pinned their faith to cheap locomotion to outlying suburbs as a means for relieving urban congestion. But the tendency of the day appeared to lie in the direction of encouraging the Local Authorities to provide healthy houses for the wage-earning classes. Now the housing question was a rural as well as an urban question; in some agricultural districts the need for better housing accommodation was very great. With the flow of rural populations into the towns it might be thought there was an abundance of cottage accommodation. But, naturally, with empty cottages the rents decreased; their value fell off, and consequently owners declined to keep them in repair. New cottages were not erected, for this was, under present circumstances, a totally unremunerative form of investment. Existing cottages were in many cases totally unfit for occupation; yet to close them would be to aggravate the evil. Dr. Paget referred to the reports of Commissions and investigations into the subject, and explained the four kinds of ownership of rural property, viz., (1) estate owners who provide cottages for some who work on their estates; (2) private owners who let cottages at the best rent they can obtain; (3) leaseholders and life-holders; (4) occupying owners — the last being rare. Dr. Paget then explained the reasons which prevented either class of owners attempting to improve the cottage accommodation in rural districts, and outlined a description of a village in Northamptonshire to serve as an illustration of the condition of cottages in small villages in rural districts. He explained the circumstances which had led up to the present position. Out of 146 cottages sixteen were unfit for habitation, twenty-one were in an unsatisfactory state, and many of the remainder were overcrowded; the population of this village of Spratton was 750. The Brixworth Rural District Council at length decided to approach the County Council under Part 3 of the Housing of the Working Classes Act, 1890. The necessary inquiry was held, but although the certificate was finally issued, the whole scheme ultimately fell through. One means of remedy, he thought, would be to provide for the Local Authority being compelled to go on with their scheme when it had been sanctioned by the County Council. A great difficulty in improving cottage accommodation in rural places was that the cost would have to be borne by the whole district rather than by the parish in which the improvement took place. This led to opposition. The principle underlying the problem was whether or not the expenditure of public money for the purpose of housing the poor in rural districts is justifiable. Within certain limits he thought such expenditure was right; but of two things he felt certain—any such expenditure should not be recklessly indulged in, and when shown to be proper it should be not less easy of accomplishment in rural districts than in urban districts. The Act of 1890 did not seem to be antagonistic to the principle of Rural Authorities becoming landlords, though opponents of this principle had certain strong grounds for their attitude. He analysed the Acts of 1890 and 1900, and pointed out that after all the trouble, time, and expense involved by an inquiry by a County Council, the Rural District Authority was under no obligation to adopt Part 3 of the Act. The case was quite different with an Urban District Authority, and in this respect the law badly needed amendment; to some extent the drawback was overcome by the Act of 1900. The substantial advantage of the recent Act was that it did away with the necessity, under certain circumstances, of waiting for an election of a new Board. Time alone would show whether the supposed simplification of procedure introduced by the 1900 Act would lead to any greater activity on the part of the Local Authorities. There was one provision in that Act which was possessed of possibilities in that direction, viz., if a Local Authority make default in regard to housing and the adoption of Part 3 of the Act, they would be liable to have their powers transferred to the County Council. The section provided that if the Parish Council resolve that the District Council should have exercised its powers under Part 3 of the Act, and if the County Council be satisfied after due inquiry that the District Council has so failed, they can then resolve that the powers be transferred. Leaving out the question whether a Parish Council was more likely to take a lead in the matter than the District Council—so far the Parish Councils had not been circularised by the Local Government Board as had been the District Councils—he was quite sure the Parish Council would only proceed in rare instances if the expense of providing cottages was likely to fall on the parish instead of the district in which that parish is situated. This raised a great question of principle—Should the expense of building cottages fall on the parish in which they were built or upon the district in which the parish is situated? Various views on this had been expressed, and several interpretations as to the meaning of the Legislature had been forthcoming, but undoubtedly in deciding the point the circumstances of each case ought to be taken into account. In very special areas it might be fair to even still further restrict the area of contribution. On the whole, the argument was rather in favour of the district than the parish bearing the burden caused by the erection of cottage property. But the Act of 1900 seemed to imply that no other area except that for which the cottages are required should bear the cost, though the machinery that Act provided appeared to be more easily workable than the other. There was, however, still room for an enlargement of the existing powers of County Councils in regard to this question, and for the work to be systematised and rendered less limited by

local criticism. He trusted to receive some expression from the members of that Society in favour of the better carrying out of the Housing of the Working Classes Acts in rural districts, particularly in the direction of a simplification of procedure, which would encourage greater activity on the part of Rural District Councils. (Cheers.)

Drs. G. Reid, J. Scott Tew, A. Newsholme, H. Beale Collins, S. Hoare, E. Seaton, Shirley Murphy, and the President took part in the debate which followed, general agreement being expressed with the views of Dr. Paget, to whom a cordial vote of thanks was accorded for his address.

BRITISH CONGRESS ON TUBERCULOSIS
FOR THE PREVENTION OF CONSUMPTION.

As already announced, His Royal Highness the Prince of Wales has graciously consented to open in person a British Congress on Tuberculosis in the Queen's Hall, London, at three o'clock in the afternoon of Monday, the 22nd July, 1901; and it has been decided that the Congress shall be held from Monday, 22nd July, to Friday, 26th July.

Every British Colony and Dependency is invited to participate by sending delegates; while the Governments of countries in Europe, Asia, and America are invited to send representative men of science, and others, who will be the distinguished guests of the Congress.

The information already gained, both at home and abroad, shows that consumption and other forms of tuberculosis, although preventable and controllable by intelligent precautions, still remains the direct cause of a high rate of death and sickness. In the United Kingdom alone some 60,000 deaths are recorded annually from tuberculosis, and it is stated on good authority that at least thrice this number are constantly suffering from one form or another of the disease.

The knowledge of these facts, and the recognition that the disease is peculiarly amenable to open-air treatment, has aroused profound international interest in the question; and in many countries public authorities have been led to put in force preventive measures directed against the propagation of consumption between human beings, between animals, and between human beings and animals.

The object of the forthcoming Congress is to exchange the information and experience gained throughout the world as to methods available for stamping out this disease. Papers will be read, and clinical and pathological demonstrations will be given; while the museum, which is to be a special feature of the Congress, will contain pathological and bacteriological collections, charts, models, and other exhibits.

Authorities in this and other countries will be invited to supply documents bearing upon the historical, geographical, and statistical aspects of the subject; while as a result of the papers and discussions, practical resolutions will be formulated which will serve to indicate the public and private measures best adapted for the suppression of tuberculosis.

The work will be divided into four sections as follows:—

Section I.: State and Municipal.—President, Right Hon. Sir Herbert Maxwell, Bart., M.P., 49, Lennox-gardens, S.W. Secretaries, Dr. Bulstrode, L.G.B., Whitehall, S.W.; Dr. James Niven, Town Hall, Manchester.

Section II.: Medical, including Climatology and Sanatoria.—President, Sir R. Douglas Powell, Bart., M.D., 62, Wimpole-street, W. Secretaries, Sir Hugh Beevor, Bart, M.D., 17, Wimpole-street, W.; Dr. Hector Mackenzie, 59, Welbeck-street, W.; Dr. R. W. Philip, 45, Charlotte-street, Edinburgh.; Dr. William Calwell, 1, College-square North, Belfast.

Section III.: Pathological, including Bacteriology.—President, Professor Sims Woodhead, M.D., 6, Scrope-terrace, Cambridge. Secretaries, Dr. Wethered, 83, Harley-street, W.; Professor Rupert Boyce, Liverpool (University College); Dr. E. J. McWeeney, 84, St. Stephen's Green, Dublin; . Dr. Perkins, 41, Wimpole-street, London, W.

Section IV.: Veterinary (Tuberculosis in Animals).—President, Sir George Brown, C.B., Bryn Hyfryd, Harrow. Secretaries, Professor Hobday, F.R.C.V.S., 27, Lower Phillimore-place, Kensington, W.; Professor Bradley, M.R.C.V.S., Royal (Dick's) Veterinary College, Edinburgh; Professor H. Woodruff, M.R.C.V.S., Royal Veterinary College, Camden Town, N.W.

Exhibition: The Museum of Pathology, Bacteriology, and Public Health.—Chairman of Museum Committee, Professor Sims Woodhead, M.D., F.R.S.E., 6, Scrope-terrace, Cambridge. Secretary, W. Jobson Horne, M.B., M.R.C.P., 27, New Cavendish-street, Harley-street, W., to whom all correspondence relative to the Museum should be addressed.

The following are the rules and regulations:—(1) The Congress shall consist of honorary members, delegates, and members.

Honorary members shall be persons nominated by any foreign Government or University, or by the Executive Committee, and shall not pay any subscription whatsoever.

Delegated and ordinary members shall be other persons, British, colonial, or foreign, who may wish to attend, including representatives from Governments or institutions within the British Empire.

(2) Delegated and ordinary members will receive their cards on forwarding the sum of £1 to the Secretary-General of the Congress, 20, Hanover-square, W.

(3) The holder of a ticket of membership is entitled to admission to all the meetings of the Congress, and to receive the "Transactions" and other publications.

Tickets to social gatherings and excursions will be allotted in order of application, or by ballot if necessary.

(4) As the expenses of the Congress will be very considerable, donations to the Reception Fund are earnestly invited. Donations of more than one guinea will be considered as including member's subscription, and will entitle the donor to all privileges of membership. Donations from corporate bodies may include the subscriptions of representatives.

(5) The official language of the Congress shall be English, French and German, and authors of papers are requested to supply beforehand abstracts for translation.

(6) Each Sectional Committee shall draw up its own working programme as to papers to be read, discussions on the subjects proposed, and miscellaneous communications. The various Sections will meet on Tuesday, Wednesday, Thursday, and Friday, from 9.30 to 1.30.

(7) The speeches delivered at the general assemblies, and the papers read before the Sections, will be published in the record of the proceedings of the Congress; but as regards miscellaneous communications and discussions, the discretion in respect of publication will lie entirely in the hands of the "Transactions" Committee and the Presidents of Sections. Each speaker opening a discussion will be limited to thirty minutes' duration, and each subsequent speaker to ten minutes.

(8) An abstract of every paper and communication must be sent to the Secretary-General, 20, Hanover-square, at the latest on or before June 15th, 1901.

Arbitration proceedings were concluded at the Midland Hotel, Bradford, last week, with reference to the price to be paid to Mrs. Crofton, of Burley Hall, by the Burley-in-Wharfedale Urban District Council for land on Burley Moor required for waterworks purposes. On behalf of the claimant, the value of the property was placed at £10,600, and for the Council at between £900 and £1000.

MUNICIPAL ENGINEERING & SURVEYING.

CROSS-TABLE CHAT.

Those engineers and chemists who are interested in the bacterial treatment of sewage will find Drs. Clowes and Houston's third and recently-issued report to the London County Council on "The Bacterial Treatment of Crude Sewage at the coke-beds at Barking and Crossness" (price 2s. 3d.) of considerable importance. Incidentally, I may mention that the engravings taken from photographs of these infinitely minute organisms, commonly known as bacteria, and admirably reproduced in the report, enlarged about one thousand times, might be usefully shown to inquisitive Councillors—a class of whom refuse to believe in the existence of any other matter in the universe, except themselves, unless the can actually see it, and who are represented on almost every deputation visiting sewage works. The coloured diagrams showing the number of spores of bacilli and bacteria in the sewage, and in bacteria bed effluents, and the very fully-detailed report of the bacteriological experiments, make the report the most important of its kind from a bacteriological point of view yet published.

From an engineering point of view the report does not assist in carrying us much further than where we were. It may, however, be useful to notice that coarse beds of Kentish ragstone of a mesh between ½in. and 4in. gave better results as regards purification than beds of coke, and that their capacity was better maintained, but that fine beds composed of coke breeze of a mesh between $\frac{1}{16}$in. and ½in. produced a better effluent, and are better able to remove organic matter in solution, than beds of ragstone of similar gauge. The capacity of fine beds after a few months' work is also, it is to be noticed, found to be about 100 per cent. greater than coarse beds.

It is observable that all the experiments were conducted with a two hours' contact. Why the original method, adopted we believe, by Mr. Dibdin four years ago should be so closely followed we are not informed. It would surely be of some educational value if the chemists were to experiment with the treatment of sewage under different periods of contact, or, on the other hand, to definitely explain that this is the absolutely perfect period, and that no other contact period can or ought to be adopted. The experiments do not, we think, evidence that originality of treatment which we might perhaps reasonably expect. Possibly the co-operation of an engineer in conducting the experiments would have been of material assistance, for such does not appear to have been the case.

The method of screening the crude sewage has been still adhered to. Rapid sedimentation before discharging the sewage upon the bed, but without septic action, is advocated; and here again no experiments appear to have been conducted to test the applicability of closed or open septic tanks. True, it is suggested that intermittent septic treatment is not deemed likely to be suitable; but is not this begging the question, for I imagine no experienced engineer advocates such a mode of treatment? Septic or sedimentation tank treatment, as is well known, is continuous and not intermittent. Then, again, there does not appear to have been, nor is it suggested as to the future that experiments will be conducted to test any one of the continuous methods of bacterial treatment.

The experiments are useful in showing that a primary or coarse-grain bed, 13ft. in depth, gives as good results as a shallow bed 4ft. in depth, and that even the bottom of the 13ft. bed was well supplied with oxygen. This may help to remove the current opinion, and one which prevails at the Local Government Board, that a depth of 4ft. is the best possible for bacteria beds.

The tables relating to the temperature readings of the atmosphere, and of the crude sewage and effluents from the beds, are explanatory of the non-influence of frost on the beds, the temperature of fresh sewage and of the interior of the beds being always higher than that of the external air. The tables showing the percentage of oxygen and of carbon dioxide in the beds—the average being 5·7 CO_2 and 8·0 oxygen as compared with the average percentage of carbon dioxide in air being 0·04, and of oxygen 20·96—are also interesting. Notwithstanding these I am bound to confess that from an engineering point of view the experiments are not, as I have already observed, so helpful, varied, or original as one had reason to expect. The London County Council are the richest Local Authority in the kingdom, and can afford to conduct experiments on a more perfect and liberal scale than any other Authority, and something more should be attempted than a repetition of experiments commenced long ago by very small Authorities.

I suppose that all surveyors throughout the kingdom will by this have renewed their acquaintance with the difficult problem of quick removal of snow from the public thoroughfares. It is, I am told, a task which somehow yields no satisfaction, for the British public in most of our towns are so indiscriminating as to expect every yard of public footways to be cleared within twenty minutes after a snowfall. Municipal surveyors are not, however, wizards to command that with every snowflake a workman shall come down with it to clear it off; but this, it is said, is just what some less enlightened ratepayers imagine. The task, however, is a Gargantuan and a costly one; but if the British public are willing to pay for it, surveyors will, I know, be equal to the occasion.

For the successful carrying out of the work, the organisation should be thorough and effective, otherwise the work is inefficiently done, and labour is wasted through the scheme having been imperfectly prepared. The best systems which I have been fortunate enough to observe are those which have been prepared months before a snowfall threatened. Then, when the snow at last came, all the men and machinery fell into work without chaos or waste of time or labour, as though they had been rehearsed for it, and miles of footways were entirely cleared of snow, and roadways opened with snow-ploughs before citizens began to move about.

In these cases I found that the surveyors allotted out their districts into a considerable number of smaller ones, to each of which a responsible ganger with a given number of men was sent. Each of these gangers is supplied with a printed sheet containing the names of the streets which he has to clear with his men, and if any additional men are subsequently engaged at the depôt they are ordered to take their place in the gang number shown on the printed sheet which is also given them. They have thus no difficulty in finding or taking their place in any gang, and the leader books each man's time on coming on. In a similar way other workmen get out with the snow plough, while carmen are set to cart away the snow on a pre-arranged and printed programme, and supervised by the surveyors themselves, who moved through the districts, observing the progress made, strengthening some gangs which were inadequate, by the addition of men from others which were too large, the work went along smoothly and expeditiously, and with infinite credit to the surveyors concerned, and laudatory comments from the public Press.

Writing of snow ploughs reminds me that the several firms of Henry Wadsworth and Sons, Halifax; Wm. Glover and Sons, Warwick; and the Bristol

Wagon and Carriage Company have all brought out special forms of snow ploughs, and I understand that these are generally kept in stock by them. It appears to me that a snow plough specially adapted for clearing footways is much required. In Russia such a snow plough, drawn, I believe, by two men, is greatly used, which can clear over a mile an hour. A third man follows with a hand-broom, sweeping away any small portions which have been missed by the plough, and the work, it is said, is effectually done. Rough hand ploughs for removing the snow from the channels in town roadways are sometimes, as I have seen, used, but these will bear considerable improvement.

SENEX.

National Health Society.

OFFICIAL TRANSACTIONS.

A VERY satisfactory result of the recent examination on "First Aid," held in Oxford, has just been received. The report of the examiner states that the "standard of efficiency in most cases was high, and the candidates generally showed an intelligent grasp of the subject." Twenty-nine candidates presented themselves from various centres, and only two failed to satisfy the examiner. The lectures in this county have been given by Miss Christine Hall.

THE attention of readers is again called to the fact that training lectures for Sanitary Inspectors will be commenced on January 29th. Lectures on "Nursing" and "First Aid," in connection with the training course for the diploma of the National Health Society, will be commenced on Thursday, January 24th, and Monday, January 28th, respectively. Intending students should communicate without delay with the Secretary, 53, Berners-street.

ASSOCIATION OF NATIONAL HEALTH WORKERS.

MEMBERS are reminded that their annual subscription to the Association of 2s. 6d. became due on January 1st, and should be sent to Miss Christine Hall, 78, Oxford-terrace, W.

On Saturday, January 5th, an excursion was made by members of the Association of National Health Workers to the North London Consumption Hospital, Mount Vernon, Hampstead. Dr. Squire kindly received the visitors, and escorted them over the new wards and balconies recently prepared for the "open-air" treatment of consumption, or rather the hygienic treatment of consumption, of which open air is only an important feature. It was difficult to believe that patients could enjoy and benefit by sleeping in the open air under the inclement conditions that have lately prevailed—the minimum temperature of the night of the visit was below freezing point. However, conversation with the invalids elicited the fact that they never felt cold, never caught cold, and never wished to sleep indoors again. A considerable amount of exercise forms part of the cure with absolute rest for several half-hours during the day, and though not "stuffed" with food—an unpleasant feature of some up-to-date methods of treatment of consumption—the patients are given a very generous diet. Some idea of the thorough ventilation of the hospital may be gathered from the statement of the Matron that some twenty broken door handles had to be replaced that very day, and several window panes re-glazed. When the members had well explored wards and balconies, day-rooms and dining-rooms, out-patients'-rooms, and recreation-rooms, they were hospitably entertained to tea by the Matron.

ROYAL COMMISSION ON SEWAGE DISPOSAL.

THE following circular letter has been addressed to Local Authorities:—

Royal Commission on Sewage Disposal,
39, Victoria-street, S.W.,
December, 1900.

Sir,—I am directed by the Royal Commission on Sewage Disposal to inquire whether the District Council have conducted any experiments as to the purification of sewage by any of the following or similar methods:—

A. Closed septic tank and contact beds.
B. Open septic tank and contact beds.
C.* Subsidence tanks and contact beds after chemical precipitation.
D. Subsidence tanks and contact beds.
E. Contact beds.
F. Closed septic tank followed by continuous filtration.
G. Open septic tank followed by continuous filtration.
H. Chemical precipitation, subsidence tanks, and continuous filtration.
K. Subsidence tanks followed by continuous filtration.
M. Continuous filtration.

If so, I am to state that the Commission would be much obliged if the District Council would kindly furnish them with the results of such experiments.

Forms have been prepared in regard to each of the above-mentioned methods, lettered A, B, C, D, &c., showing what results the Commission are anxious to see, and it will be of considerable convenience to the Commission to have the results submitted on these forms.

On learning what experiments have been conducted I shall be happy to furnish you with suitable forms.

I am, Sir,
Your obedient servant,
F. J. WILLIS,
Secretary.

The Clerk of the District Council.

SCARLET FEVER IN YOUNG CHILDREN.

SCARLET fever has become of late years a much milder complaint. How much of this is due to the greatly increased use of isolation hospitals, and how much to an amelioration in the natural type of disease, may be matter of dispute; but it still remains true that its chief fatality is at the ages under five, when one out of twenty-eight attacked die; while at ages from five to ten only one out of 333 attacked die, and at subsequent ages there are practically no deaths. All these facts point to the importance of protecting children under five from exposure to infection. Chief among such means of infection is the attendance of children in the infants' class at school long before the age at which compulsory school attendance begins. If any great educational advantage were associated with the attendance at school of children from three to five years of age, a case might possibly be made out for the continuance of what now means a heavy annual death roll.

I am prepared to admit that the advantages of elementary education are so great as to render the sacrifice of life or of health for a minority a public necessity. The only point is to ensure by proper precautions that

* The expression "subsidence tanks" is intended to denote tanks which are used so that little or no "septic" action is produced.

this sacrifice should be the least possible. But in the case of infants under five years of age it does not appear to me that there is any educational advantage at all commensurate with the present loss of life caused by such attendance in infant schools.—*Dr. A. Newsholme, Annual Report*, 1899.

Sanitary Inspectors' Associations.

THE NATIONAL UNION.

The fourth meeting of the session of the North-Western District Centre of the National Union of Sanitary Inspectors was recently held at the Co-operative Hall, Manchester, Mr. Robert Lowe, of St. Helens, presiding. Representatives were present from a large number of towns. An interesting paper was read by Mr. G. W. Laskey, Chief Sanitary Inspector of Eccles, who dealt in the main with the question of sanitary arrangements in private houses, and enforced the necessity of fitting up the most modern system. As to the question of the responsibility for providing funds for bearing the cost of changing the systems, he could see nothing logical in the property owners' objection of bearing the expense. The change to an improved and more healthy system certainly increased the value of their property, and brought them in a better return. If once the principle of improving property out of the rates were admitted, there would be no end to the claims on the public purse, and owners of property which was satisfactory in respect of all its sanitary arrangements would naturally object to having to contribute anything towards the cost of improving that of others. He contended that they should try to arrive at something like uniformity of action. The time had arrived when no more antiquated structures should be allowed to be erected, especially in those districts which were furnished with adequate water supplies and efficient sewage systems. A great deal of success might be attained by persistently calling attention to the defects in those old structures, and by dwelling upon the responsibility of owners for any cases of infectious diseases which might be attributable to those conveniences. In a few years hence owners of property furnished with the old systems would be compelled to adopt more modern requirements.

LAW CASES.

Tuberculosis in Cows.

An important case to farmers and milk consumers was tried by his Honour Judge Whithorne and a jury at Birmingham County-court. An action was brought by Clement Haynes, Lea-end, near Alvechurch, farmer, against George Keys, of the Home Farm, King's Heath, farmer, to recover £33 damages for breach of warranty. In September last the plaintiff agreed to purchase three cows from the defendant for £33. The defendant, he said, warranted the cows to be perfectly right and healthy. He left the cows for three or four days at the defendant's place till he could send for them. On the fifth day he received a letter from the defendant saying that one of the cows was ill, and soon after another letter that it had died from eating acorns. A post-mortem examination showed that the lungs of the dead animal were "rotten with tuberculosis." Of the other two cows one was healthy and the other was affected with tubercle. On the advice of his solicitor, the plaintiff removed the two cows and paid the £33 to the defendant without prejudice. The action was brought to recover the money from the defendant. It was explained that the afflicted cow removed by the plaintiff would not be used by the plaintiff as a milch cow, but would be killed after calving. The defence was a denial of the warranty. One of the veterinary witnesses (Mr. Gould, of Redditch) said that 40 per cent. of the dairy cows in the county suffered from tuberculosis. He explained that by this he meant housed cows.

His Honour: That is a matter of fearful public interest. Witness said it did not affect the milk unless the tuberculosis extended to the udder, then it was most dangerous.

The jury gave a verdict for the plaintiff for £22 10s.

Defiance of the Factory Act.

Mr. Rose, at the West London Police-court, heard the adjourned summonses against the Henrici Laundry Machinery Company, Limited, for employing two women between one and two o'clock on December 17th, being the time specified for meals; and also for employing a woman between 7 a.m. and 7 p.m., the specified period for work being 8 a.m. to 7 p.m.

Her Majesty's Factory Inspector stated with regard to the first two cases that the offence was a technical one merely, and if the laundry had been well managed in other particulars no action would have been brought, but in this case the laundry had defied the law, and had failed to comply with any previous instructions. He therefore asked for a full penalty.

The Magistrate imposed a penalty of £2, with 14s. costs in each case.

It was proved in the third case that no notice of variation of the period of employment had been posted.

The Magistrate imposed the full penalty of £3, with 4s. costs.

FORTHCOMING MEETINGS.

January.

Friday, 18th.—Institution of Mechanical Engineers.—Annual general meeting: Further discussion on "Power, Gas, and large Gas Engines for Central Stations," by Mr. Herbert A. Humphrey. 8 p.m.

Friday, 18th.—Epidemiological Society.—Messrs. Louis Parkes, M.D., and Samuel Rideal, D.Sc., F.I.C., on "A Suggested Method of Preventing Water-borne Enteric Fever among Armies in the Field." 8.30 p.m.

Monday, 21st.—Surveyors' Institution.—Junior meeting. Mr. L. S. Wood on "Income Tax, Schedule A." 7 p.m.

Tuesday, 22nd.—London County Council resumes.

Thursday, 24th.—Society of Architects.—Sessional meeting. 8 p.m.

Thursday, 31st.—Association of Birmingham Students of the Institution of Civil Engineers.—Annual dinner at the Grand Hotel, Birmingham. 7.30 p.m.

February.

Saturday, 2nd.—Sanitary Inspectors' Association.—Dinner at Holborn Restaurant.

Mr. James Mansergh, C.E., presented a voluminous report to the Richmond (Surrey) Town Council last week, advising it to abandon any further extension of the borough waterworks, and seek a supply from the Southwark and Vauxhall Water Company, which already gives part of the supply. The town carried on its own waterworks for a quarter of a century, and spent nearly £100,000 in digging for water in the chalk and other underlying beds, there being a strong feeling in the borough against the Southwark and Vauxhall Company, but Mr. Mansergh said they had experimented long enough. No action was taken in the matter.

NOTICES.

ANNUAL SUBSCRIPTIONS.—The Annual Subscription to "THE SANITARY RECORD," for the United Kingdom, paid in advance, is 12s. 6d. For the Colonies and Abroad, 15s This includes postage, and a Copy of the Diary, post free.

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The Sanitary Record
AND
Journal of Sanitary and Municipal Engineering.

JANUARY 17, 1901.

THE BEER POISONING QUESTION.

THE Government have appointed a Royal Commission to inquire into the epidemic of poisoning through the presence of arsenic in beer. This step is a natural one, and well fitted to allay the public anxiety that has been excited by recent revelations in Manchester and the Midlands. But the inquiry is not to be limited to beer alone. The instructions of the Commissioners are "to ascertain the amount of the recent exceptional sickness and death attributable to poisoning by arsenic; whether such exceptional sickness and death have been due to arsenic in beer, or in other articles of food or drink; and if so, to what extent, by what ingredients, or in what manner arsenic was conveyed, and in what way any such ingredients became arsenicated; and if it is found that exceptional sickness and death have been due to arsenic in beer, or in other articles of food or drink, by what safeguards the introduction of arsenic therein can be prevented." The Commission is a strong one. It comprises Lord Kelvin; Sir W. Hart-Dyke; Sir W. S. Church, president of the Royal College of Physicians; Professor J. E. Thorpe, Government Analyst; Mr. H. Cosmo Bonsor; and Dr. A. Whitelegge, Chief Inspector of Factories; with Dr. G. S. Buchanan, of the Local Government Board, as secretary. So far as the facts are concerned, the way has already been paved by the report of the Manchester Commission, which is now a matter of public knowledge. Though the scope of the inquiry is in its terms a broad one, there is no doubt that the principal subject of investigation will be beer, with special reference to the use of substitutes in brewing through which arsenic may be introduced, and in so far it will open up afresh the whole question dealt with by the Pure Beer Commission several years ago. Recent experience has made the country feel that the report of that Commission was not justified. There is a strong opinion prevalent that legislation to secure the purity of beer is required, both in the interests of the public health and in the interests of the greatest of our national industries. And that feeling is already finding voice, in no uncertain manner, with men highly qualified to indicate the probable course of future legislation. Mr. Chaplin has on more than one occasion of late stated most emphatically that legislative action is necessary, and though no longer a member of the Government, his influence is certain to carry great weight with the Ministry. And Lord Londonderry, who is a member of the present Government, at the annual dinner of the Newcastle Farmers' Club, the other day, said that legislation to ensure beer sold to the public being made with honest, sound materials—that is, as may be gathered from an immediately preceding sentence, pure malt and hops—was an absolute necessity. To these statements must be added that of Mr. Walter Long, the President of the Local Government Board, whose pronouncement is eminently satisfactory from a public health point of view. Mr. Long mainly dwelt upon the financial aspect of the question, but observed, *en passant*, that if it was a question of public health, taxation would have to stand on one side altogether. All such utterances must, of course, pending the report of the Commission, be taken with a certain degree of reserve, but they are, in a sense, authoritative, as indicating the present temper of the Government and the nation. Meanwhile it is interesting to note that a step in the direction foreshadowed in a recent leading article appearing in these columns has been taken, an influential association having been formed to promote the purity of beer by parliamentary measures and otherwise. Mr. Chaplin has made an appeal through the Press for the co-operation and support of all who are interested in the subject, and we feel quite sure there are many among our readers

who will gladly give any assistance in their power to a movement which is so directly associated with the health of the people, and consequently has every claim upon our sympathies.

The Diet of the Poor.

Some Edinburgh doctors have recently concluded an exhaustive investigation into the nature of the diet of the poorer classes of that city, and one of their number, Dr. Noel Paton, gave the results at which they had arrived in a public lecture last week before the Scottish Society of Economists. The object of their researches was to ascertain exactly what dietary was necessary to constitute the proper food supply of the average working man, and the conclusion reached was that the poorer classes of working people did not receive the food necessary for what had been estimated, as the amount of energy an ordinary labourer should be able to expend on his work. As a matter of fact, he said, taking some examples of the daily diet of those of the poorer classes whose wages were irregular, it had been found that the free labourer in these cases received less energy-producing food than did the inmates of our asylums, hospitals, and prisons. He instanced as rather a curious thing in this connection that oatmeal—which was at one time supposed to be the staple food of the poorer classes in Scotland, and which contains the elements of an almost ideal food—came far down the list of the various articles of dietary in the proportion used. Bread, potatoes, milk, vegetables and beef, all preceded it, the average use of oatmeal in the cases investigated being only 1½ oz. per day. He suggested that some good might be done, as a first step, by distributing simple tables showing the amount of work-producing power which could be got for a pennyworth of ordinary articles of diet. The regrettable thing about this state of matters is that it is not a question of want of money. The change—for a change it undoubtedly is, and a change for the worse—may partly be attributed, we believe, to the rise in the standard of social comfort which has accompanied the rise in wages for working men, resulting in the discarding of many of the old-fashioned simpler articles of diet for others that are more expensive, but have less life-sustaining power in them.

Sewage Purification in Dumfries.

It has been amusing to watch the wriggling of the Town Council of Dumfries in their attempts to deal with the question of the purification of their sewage. We have already in these columns referred to the previous history of the matter; how, in consequence of the pollution of the river Nith—into which the sewage of the town has hitherto been discharged—the Corporation have been ordered by the Secretary for Scotland to provide a satisfactory system of sewage purification within a limited time, and how after consulting Mr. Carter, C.E., Edinburgh, he recommended the adoption of a scheme which he estimated would cost £30,000. The Council, however, were staggered at the idea of the cost, and resolved to send a deputation of inquiry to investigate the matter for themselves. The deputation visited various sewage works in England and Scotland, and returned to express the opinion that the bacterial process, as they had seen it in operation, particularly at Sutton and Barrhead, was most suitable for Dumfries, where the sewage was mostly domestic. But this was precisely what Mr. Carter had already recommended. Still unsatisfied, the members of the Council suggested all sorts of devices to enable them to wriggle out of the difficulty. The Provost stuck to his opinion that at no place which he had visited had he seen finer sewage disposal works than the Nith itself, with all deference to Colonel Gore Booth, who conducted the inquiry into the pollution of the river, and whose views on sanitary science he characterised as very much in advance of this generation, probably of several generations to come—we should be disposed to add, most certainly in advance of the worthy Provost himself. The upshot of the whole matter was the adoption of the Committee's recommendation that Mr. Carter should be asked to meet the Council in conference to explain various details. No doubt, notwithstanding all these kickings against the pricks, Mr. Carter's scheme will have to be adopted.

A Good Record in the West Riding.

The last meeting (prior to the election) of the West Riding County Council was held last week, and the Chairman took advantage of the occasion to review the work of the past three years. Two or three points are worthy of notice. In at least two important items he was able to report a decreasing expenditure. In 1899 and 1900 the cost of lunacy in the county district averaged £51,985, against £53,375 in the three preceding years. This is decidedly an encouraging fact, more particularly when most counties are compelled to report the reverse. It was also pointed out that the ratio of lunacy in the West Riding was 20·82 per ten thousand, as compared with 30·47 for England and Wales. Reduced expenditure was also reported in the main road accounts. In March, 1900, the total mileage of main roads was 1111 miles. Without in any way decreasing the efficient upkeep of these, the cost had been reduced from £146 to £133 per mile. The total expenditure for each of the last three years was:—In 1898, £165,224; 1899, £162,570; and in 1900, £151,477. Going on to refer to the other administrative work of the Council, the chairman said they were endeavouring to secure larger powers for district authorities in regard to tuberculosis, and 5101 samples had been taken in three years under the Foods and Drugs Act, and 196 convictions had been obtained out of 218 prosecutions. It was satisfactory to the Diseases of Animals Committee to be able to report that during the three last years there had been only one case of rabies in the Riding. Swine fever unfortunately showed a strong vitality, the outbreaks in the geographical West Riding being 188 in 1898, 225 in 1899, and

230 in 1890. The total county rate basis in 1898 was £7,157,022, and in December, 1900, £7,493,845. The number of county electors in 1889 was 242,060, and this year it was 280,142.

A Temporary Loss.

The retirement of Mr. E. T. Cook from the editorship of the *Daily News* is a distinct loss to the cause of social reform, but we trust it may only be of short duration. During the five years he has directed the affairs of our contemporary, every movement for improving the surroundings of the people has received a most cordial and sympathetic support. We can never forget that it was through the advocacy of the cause of the half-timer in the *News* that the country was aroused to the importance of the question, and Parliament was compelled to pass Mr. Robson's Bill, in spite of the opposition of interested manufacturers and even the Lancashire workers themselves. To Mr. Cook also we owe the sending of a special commissioner all over the metropolis to investigate the extent of the "house famine," which was the burden of complaint by many advocates of housing reform. Nor was he content when the vastness of the evil in London had been laid bare. Inquiries in rural parts, and particularly in the eastern counties, revealed a condition of things equally appalling, and it is to this work that the housing question occupied the foremost place in the list of urgently-needed social reforms. The predominating idea in all Mr. Cook's work was to get at the truth. Party cries, as such, had no influence over him, and the unquestioned honesty of all his actions won for him a position in journalism such as it is given few men to attain. There is, alas, such an air of artificiality in the daily Press of to-day, that the loss of such a worker is greatly to be deplored, and we trust it will not be long before Mr. Cook finds another sphere in which he may again serve the cause of reform.

Stamping out Disease.

A paragraph in the report presented by the West Hartlepool Town Council last week by the Medical Officer of Health shows how prompt action on the part of officials may be effectual in stopping the spread of disease. After enumerating the cases of zymotic disease during December, Dr. Morison said that the "two cases of small-pox were at once removed to the Port Sanitary Hospital. One case was the mother of a previous patient, the second was a sailor who came from Stockton, his ship having come from Bilbao. The Medical Officer of Stockton and the owner of the ship were both informed of the case. We can now congratulate ourselves that we are free from the grave danger of an epidemic. That the danger was great is shown by the strange fact that our cases were traced to no less than five separate and distinct sources of infection. In one case, owing to peculiar circumstances, I persuaded the man in the house to stay off work for a fortnight, and after speaking to your chairman promised him the amount of his wages for that time. In another case it was thought advisable to have all the wall papers in the house stripped off and the walls lime-washed. This was willingly done by the people, and as they are poor, I would ask that you bear the cost." This action of the Medical Officer is described by the local paper as "daring," as if it was very novel. We are afraid that too many do not realise that they have the power to take such measures, or some silly sentimental objection is allowed to prevent it being done. But why should it? The man loses his week or two week's work for the safety of the community, and it is far cheaper to pay him for it than to be overrun with small-pox or some other disease.

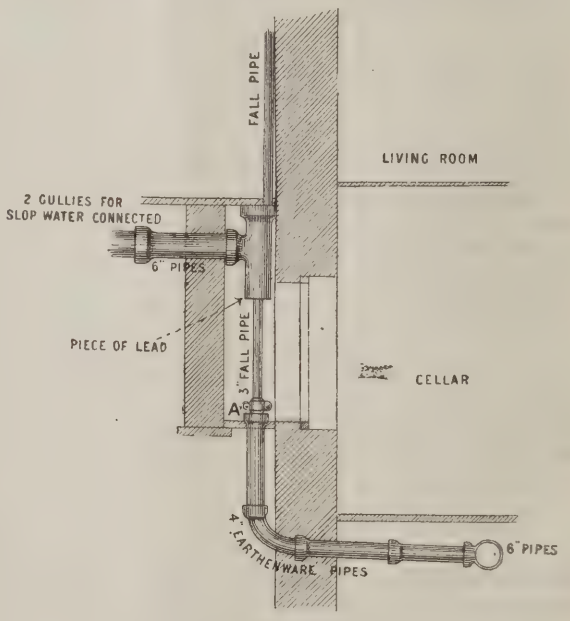
CORRESPONDENCE.

(We do not in any way hold ourselves responsible for opinions expressed by our correspondents.)

(To the Editor of The Sanitary Record.)

A CURIOSITY IN SANITARY DRAINAGE WORK.

Sir,—I beg to enclose you sketch of one of the curiosities of the Twentieth Century. In consequence of an outbreak of typhoid fever in a certain quarter of our district, the Surveyor and myself have been making a close inspection thereof; and I need not tell you of our surprise to find existing the somewhat mechanically



and curiously-constructed state of things, as indicated by the accompanying sketch, by which you will see that a 3in. cast iron fall pipe enters perpendicularly the end of a 6in. junction pipe, to which junction pipe are connected two 9in. gullies for slop water. The said junction pipe is joined to, and rests on the end of a 3in. cast iron pipe, supported inside most curiously by a piece of lead; then the bottom end of the 3in. pipe referred to is endowed with two lugs, which appear to act as a support to the whole fabric. The drain is then continued with 4in. earthenware pipes, of clay joints, and takes its course underneath the floors of a block of houses, back to back. Every joint of the whole thing admits of a

serious leakage. At the time of our visit the leakage from joint A was such that it percolated through the wall into the area, thence through the window on to the cellar floor. The terrible effects resulting from a condition of things of this sort need no comment. Neither were we surprised (on finding such an arrangement of things) to learn that the tenants were complaining and suffering from various physical ailments. — Yours faithfully, W. W.,

December 12th, 1900. Sanitary Inspector.

A CLEAN BILL OF HEALTH.

Sir,—I have read with interest Mr. Ernest Worrall's letter in your issue of the 10th inst., wherein he states that he believes it rare for an urban district to be entirely free from infectious disease for twelve months. He also draws attention to Penmaenmawr, in North Wales, with a resident population of 3500, which has attained this enviable distinction. Mr. Worrall inquires if any of your readers can of their own knowledge relate a like condition elsewhere. In reply I beg to submit particulars of Ramsey, Isle of Man, which shows an even better record. Resident population, 5000. Number of summer visitors, about 12,000. No case of infectious disease as defined by the Infectious Diseases (Notification) Act, 1889, notified as occurring within the town from August 27th, 1899, to November 26th, 1900. On the latter date a child was reported as suffering from scarlet fever.

A few years ago the conditions of Ramsey as a health resort were not good. Now they are excellent.—Yours faithfully, George W. Irwin.

Surveyor's Department, Ramsey,
Isle of Man, January 10th.

Public Works.

SEWERAGE.

Sanction has been obtained to a loan of £8000 for the Woodford sewerage works.

The Brierley Hill Council has decided to apply for a loan of about £32,000 for sewerage, sewage disposal, depôt, road-roller, &c.

The contract for Dalry drainage has been given to Mr. James Urquhart, Renwick. The contract price for the drainage alone amounts to £3018.

A Local Government Board inquiry has been held at Leyburn with reference to the application of the Rural District Council to borrow £5200 for sewerage purposes.

A circular letter from the Royal Commission on Sewage Disposal, asking to be furnished with results of experiments has been referred to the Newmarket Surveyor by the Urban Council.

The West Bromwich Corporation proposes borrowing £15,000 to carry out a scheme recommended by the Borough Surveyor (Mr. A. D. Greatorex) in his recent report on the bacterial treatment of sewage.

The Cockermouth Urban District Council is about to call for tenders for the proposed further surface drainage of the town, with a view to preventing the flooding of some parts of the town during heavy rains. The estimate is £198.

Col. Hepper, Local Government Board Inspector, held an inquiry at Conway last week with reference to an application by the Borough Corporation for power to borrow £770 for purposes of sewerage. It was explained that all the money had been expended, being excess expenditure on the Gyffin and Penybont sewers. The main item in the account submitted was for the outfall of the Gyffin sewer, which, owing to the objection of the County Council to allow the pipe to be laid through a county bridge, had to be laid in a different direction to that originally proposed, necessitating the placing of the outfall through a mud-bank

The Biddulph Urban District Council is contemplating a scheme of sewage disposal for its district.

A Local Government Board inquiry was held recently at Fulwell, concerning the application of the Rural District Council for sanction to borrow £300 for the sewerage works, and a proposal to execute certain works outside their district and in the borough of Sunderland. The Town Clerk of Sunderland appeared to oppose the latter proposal, and Mr. W. S. Hope represented the Fulwell Authority. The point in dispute is as to who shall own certain sewers if they are constructed. Evidence was taken, and the decision will be made known at a future date.

At a meeting of the District Committee of the Lower Ward of Lanarkshire held in Glasgow recently, in moving the adoption of the minutes of the joint Sub-committees of the County Council and the District Committee in connection with the proposal by the Corporation of Glasgow to obtain power to impose a sewage purification rate on two areas in the Lower Ward district, the Chairman said the only thing he did not like in the outlook was that in his experience Glasgow officials were apt to delay matters very much. He thought in the long run they would be able to come to a settlement that would be satisfactory to the Lower Ward.

A special meeting of the Walton-on-Naze Urban District Council was held last week, when the following resolutions were confirmed:—That the tender of Messrs. J. Moran and Son, for main sewerage and sewage disposal at £8950, be accepted; that application be made to the Local Government Board for sanction to borrow an additional sum of £2100, to carry out the scheme on particulars to be furnished by the engineers, Messrs. Beesley, Son, and Nichols; that Mr. Buckley, as recommended by the engineers, be appointed resident engineer during the works at a salary of four guineas a week, subject to one month's notice to discontinue on either side; that a Main Sewerage Committee be appointed, consisting of the chairmen of the Sea Defences, Sanitary and General Purposes, Building and Lighting, Finance and Licensing committees.

The published conclusions of the Sub-committee of the Bradford Sewage Committee, who went to Roubaix last year to inspect the Delattre process of grease extraction, are not very definite. The gist of them is that the Bradford sludge dealt with last time was not the most suitable in point of density, and hence the present proposal to send a somewhat different sludge. It must not be supposed that this process, if successful, will solve the whole sewage difficulty. At Esholt sludge, of course, would be produced. It is a question whether the Delattre invention is a really profitable method of dealing with the sludge. The grease recovered in the last experiment has been valued by a grease distiller at £9 a ton on the spot. Apparently the Sub-committee goes so far as to state that the Delattre method, while not one that could be economically used by individual firms, is likely to prove advantageous for dealing with a large quantity of suds producing over twenty tons of sludge a day.

The Royal Commission on Sewage Disposal recently visited the Reigate Corporation sewage works at Redhill to inspect the Candy-Caink revolving sprinkler system and polarite oxidation bacterial bed, which has been in highly successful operation there for over two years. Sir Michael Foster, M.P., F.R.S., Major-General Phipps Carey, Col. Harding, and Mr. J. J. Willis, the visiting members of the Commission, were met at Redhill by the Mayor, the Borough Engineer (Mr. W. H. Prescott), Mr. Frank Candy, and Mr. F. Pullen Candy, and made a careful investigation of the bacterial system, which, by means of the polarite oxidising aërobic bed fed in an intermittently continuous manner by the Candy-Caink revolving sprinkler, converts with about half an hour's treatment a very strong sewage containing tannery and brewery refuse into a first-class effluent, bright, odourless, and oxygenated. After the inspection the members of the Royal Commission adjourned to the Town Hall to take the evidence of Mr. Frank Candy, general manager of the International Purification Syndicate, 109, Victoria-street, Westminster, on the subject, and of the Borough Engineer (Mr. W. H. Prescott), who explained the entirely satisfactory working of the system and tendered analytical results showing an average purification of 97 per cent.

THE Uttoxeter Rural District Council has approved of the scheme by Messrs. Willcox and Raikes for the sewerage and sewage disposal of the parish of Denstone.

FOUR tenders, ranging from £2431 to £1693 have been received by the Plymouth Works Committee for the extension of the sewage outfall at Little Prince Rock. The Borough Surveyor's estimate of the cost was £1340, and he is to execute the work.

WATER.

THE Local Government Board has ordered a public inquiry to be held at the Guildhall, Westminster, on Monday, the 11th of next month, in regard to the new regulations made by the London water companies.

AT a special meeting of the Brynmawr Urban District Council, Mr. Haller, of the firm of Hallar and Machell, civil engineers, Dewsbury, submitted plans for improving the water supply of the town, at an estimated cost of £14,361 16s. 9d. After discussion, the further consideration of the scheme was deferred to a future special meeting of the Council.

AT a meeting of the Barrow Town Council recently the final steps with regard to the promotion of a Bill in Parliament for obtaining water from the river Duddon and Seathwaite Tarn were agreed to. It was also decided in response to a deputation from the Ulverston Rural District Council, whose district obtains its water supply from the Barrow Corporation, to supply water in bulk at 6d. per 1000 gallons, private consumers to be charged the same rate as those at Dalton.

LAST week a public meeting was held at Wolverhampton to consider the proposal of the Town Council to borrow £200,000 in connection with the Water Bill. Alderman Marston (chairman of the Water Committee), who described the scheme, said there was an idea that they could obtain water very cheaply by tapping the mains of the Birmingham scheme at Hagley, but the cost would amount to about £80,000 in works alone. The Town Clerk referred to the letter of Mr. Capel Cure, and said it was entirely a misapprehension to say that the Corporation was desirous of robbing people of water. There was no right in underground water. On the motion of the Mayor, a resolution was unanimously adopted approving of the Bill.

AT the last ordinary monthly meeting of the Thorne Urban Council, a subject in which a great amount of interest was centred was the water question, Mr. Fairbank, A.M.I.C.E., of London, attending. The County Council, in reply to a deputation, stated that if some definite steps were not taken by February 11th it would carry out a scheme and charge the cost to the district. It was stated that a fourth of the cost of the scheme would be charged upon land. All the members of the other parishes strongly deprecated the scheme, and meetings are being held in the various townships to protest against the action of the County Council. In the end Mr. Fairbank was instructed to submit a scheme, and also an estimate of the cost.

AT Haddington Town Council last week a very serious question was under special consideration. Some seven or eight years ago the Board introduced an augmentation water supply from Longyester, which is several miles south of the burgh, at a cost of between £6000 and £7000. The condition of the supply, especially in times of rainfall, has never been very satisfactory owing to discoloration and sediment, but only now has an alarming state of affairs been discovered in the fact that the pipes conveying the supply are in some places nearly closed with encrustation of a peculiarly hard character. Councillor Dr. Wallace James stated that he had analysed the encrustation and found it to consist of carbonate of iron, and probably the only remedy was at once to face the question of exposing the water for a considerable time in a settling pond. Councillor Dr. Ronaldson also strongly advocated dealing with the question on expert advice. After an animated discussion, in which the serious state of matters was fully admitted, the Board resolved to at once call in the services of Mr. Tait, C.E. The matter is naturally creating some dismay in the districts affected, as house pipes are found to be as seriously affected as the mains. The water comes from hill springs at the foot of the Lammermoors.

A MEETING of the Water Committee of the Aberdeen Town Council was held recently, when the attention of the Committee was drawn by the Convener to the present debt resting on the water supply undertaking, and he suggested that they should make some effort to wipe off this debt, at present £196,000. With the view of going in for a fresh scheme, which would be at considerable cost, it is thought advisable to raise the present rate by at least 1d. per £. In the meantime Mr. Cran, City Chamberlain, was asked to bring up a report on the matter. The feeling of the meeting was that a gradual increase on the present rate should be made. In all probability an increase of 1d. per £ will be made during the present year.

LAST week a largely-attended public meeting was held at the Mechanics' Institution, Stockport, in opposition to the proposal of the Corporation of Stockport to promote a Bill in Parliament for obtaining a further supply of water from the district of Kinder Scout, at an estimated cost of £820,000. The promoters of the Bill find that in ten years the limit of supply will have been reached, and are advised by Mr. Mansergh and other experts that the district of Kinder Scout offers the best source for meeting the future requirements of the rapidly growing district, the estimated cost of the new scheme being £820,000. It is proposed to construct reservoirs and other works only as they may be needed, thus spreading the outlay over about thirty years.

AT the St. Helens Water Committee meeting last week the Borough Water Engineer, Mr. J. J. Lockland, in a report stated that the present reservoirs at Brown Edge and Eccleston had a capacity of two million gallons and half a million gallons respectively. As the average daily consumption in summer or in time of frost was now 3½ millions per day, and had occasionally reached four millions the capacity of the reservoirs was thus equal to about two-thirds of one day's supply. This quantity, however, could not be regularly depended upon, as, owing to the demand for water being greater during the middle of the week than at the week end, there were frequent occasions on which the reservoirs were entirely empty. A breakdown at either the Knowsley, Kirkby, or Melling stations it would be possible to meet, by using the surplus power in reserve at one or more of the other stations, and this condition would probably continue for some years until the increasing demand for water should overtake the surplus quantity of supply. This surplus was that expected to be available at the Melling pumping station when regular pumping was commenced there. At the present time there was no surplus except the Collins Green water, which was not always surplus. The pumping main from Melling to Brown Edge conveyed the water pumped at Knowsley and Kirkby —2½ million gallons per day—and would be used for the supply from Melling until the total quantity should exceed four million gallons per day.

LIGHTING.

A PROVISIONAL Order for the extension of their mains and gasworks to Ruislip, Harefield, and Ickenham, is now being applied for by the Pinner Gas Company.

THE Nuneaton and Chilvers Urban District Council has decided that the electric works be extended at an outlay of £2500, the floors to be erected above the level of the recent flood.

THE Shoreditch Borough Council has accepted the tender of Messrs. Alton and Co., of Laurence Pountney-lane, for the supply of steam pipes, feed pumps, storage tank, and sundry ironwork to the electric lighting station.

THE Doune Gas Company having been in financial difficulties for a considerable time, a new company, under the title of the Doune Lighting Company, Limited, has been formed with the purpose of taking over the works and plant of the old company. The capital is £1000, divided into 2000 shares of 10s. each.

THE Urban Authorities of Bognor have obtained an Order from the Board of Trade for the purpose of lighting the town with electricity, and are now considering the advisability of organising a scheme for carrying out the work. The local gas company is putting forward an opposition scheme in favour of incandescent lamps.

Dumfries Town Council, having obtained a Provisional Order for the supply of electricity, has instructed a committee to consider the question of the appointment of an engineer to prepare a scheme, and to submit a name.

The Electric Lighting Committee has resolved to recommend the Leith Town Council to borrow money from time to time for electric lighting purposes, up to the limit already authorised by the Secretary for Scotland. There has already been borrowed £44,000, leaving £21,000 still available.

The manager of Troon Corporation gasworks reports that the quantity of gas made at the works from May 15th till December 31st, 1900, was 6,640,400 cubic feet, being an increase of 1,940,900 cubic feet as compared with the seven months in 1899, extending from June, when the works were municipalised, till December.

A Local Government Board inquiry was held at Wigan recently in regard to the Council's application to borrow £16,500 for electric light purposes. Sanction had been obtained to borrow £85,000, and the present application was to meet demands for current in the streets not touched at present. There was no opposition.

A Bill has been deposited for introduction into Parliament next session under which it is sought to incorporate a company under the name of "The Cleveland and Durham County Electric Power Company." The general purposes of the company are to produce and supply electrical energy or power in bulk to authorised distributors for lighting purposes, and to persons for power purposes only. The area within which the company may carry on business comprises the whole or portions of the unions of Easington, Sedgefield, Hartlepool, Stockton, Darlington, Teesdale, Auckland, Weardale, Lanchester, Durham, and the following unions or parts of unions in the North Riding of Yorkshire, viz., Middlesbrough, Guisborough, and Stokesley. Generating or power stations are proposed to be erected in the parishes of Witton-le-Wear, Lanchester, Consett, Hutton Henry, Woodham, Brotton, and Billingham.

The Board of Trade returns relating to the gas supply of the kingdom give some interesting particulars concerning the gas supply of the metropolis. There are five companies engaged in supplying London with gas light. The Gas Light and Coke Company, which is the largest of the five, and the largest in the world for that matter, supplies 22,000 million cubic feet of gas in a year; the South Metropolitan, which comes next, supplies 10,000 million cubic feet; and the other three—the Commercial, the Crystal Palace District, and the Wandsworth and Putney, to take them in their order of magnitude—supply about 4300 million cubic feet. The total output of the five companies amounts to about 36,300 million cubic feet, or over 26 per cent. of the total gas sales in the whole of the United Kingdom. Although the Wandsworth Company is the smallest of the five, it charges less for gas than any of the others. This company charges at the present time 2s. 4d. per thousand cubic feet, while the Gas Light and Coke charges 3s. 5d., the South Metropolitan 2s. 8d., the Commercial 3s., and the Crystal Palace and District 2s. 10d. per thousand cubic feet.

A Bill to confer further powers on the Shrewsbury Gas Light Company has been deposited for introduction into Parliament next session. Under this Bill the company propose "as from the 30th of June, 1901," to convert their existing £65,490 7½ per cent. consolidated ordinary stock into £98,235 "converted ordinary stock entitled to a uniform maximum dividend of 5 per cent." The converted stock is to be registered in the names of the shareholders who appear on the books of the company on the date specified in the proportion of £150 for every £100 of the existing stock. The company also seek power to raise £80,000 additional 5 per cent. capital "to meet the increasing demand for gas within their area of supply." The new capital is to be offered by auction or tender, and any sum of money received by way of premium "shall be expended in extending or improving the works of the company or in paying off money owing on mortgage." Upon the converted capital of £98,235 the company ask for power to borrow "forthwith after the passing of this Act," any sums not exceeding £26,666, including the sum of £16,000 already borrowed, and upon the additional capital of £80,000 borrowing powers are sought to be exercised to the extent of one-third of the amount raised from time to time.

The Bermondsey Borough Council has decided to accept the tender of Messrs. Crampton and Co. for supplying and erecting arc lamp columns and arc and incandescent lamps at £2595.

At its last meeting the St. Alban's Council adopted the report of a Committee recommending the introduction of electric lamps for lighting the streets. It is probable that the local gas company will construct the works at a cost of £20,000.

Further particulars are published in the *Gas World* of the huge scheme for the supply of fuel gas in South Staffordshire and East Worcestershire for which the sanction of Parliament is to be sought in the coming session. The capital proposed is £1,000,000, with borrowing powers to the extent of one-third of the paid-up capital. The district sought to be exploited includes the following boroughs and urban or rural localities:—Dudley, Smethwick, Walsall, Wednesbury, West Bromwich, Wolverhampton, Amblecote, Bilston, Brierley Hill, Coseley, Darlaston, Handsworth, Heathtown, Lye, and Wollescote, Oldbury, Perry Barr, Quarry Bank, Rowley Regis, Sedgeley, Short Heath, Stourbridge, Tipton, Wednesfield, Willenhall, Halesowen (Rural), Kingswinford (Rural), and Walsall (Rural). It is intended that the gas shall be used for motive power and for heating purposes, "or for any other purpose to which such gas can be applied, but not for illumination."

In further reference to the "Electric Lighting Boards" system of electric lighting, the new company which has lately been formed to exploit the work under the title "Electric Lighting Boards (British Manufacturing Company) Limited" has made a most effective start by supplying the large quantities of patent strip used in the great Palace of Glass scene in the Drury-lane pantomime, and in the marvellous Ball Room scene at the Hippodrome, which have created such sensations. Effects of such brilliance would have formerly been quite outside practical politics on account of expense. At the Hippodrome the British Electric and Telephone Company applied the new strips, and at Drury-lane Messrs Salviati and Jesurum did the installation work, in both cases in consultation with Mr. Julian Halford, the company's manager, and inventor of several of the accessories in connection with the system. These two very comprehensive applications under particularly difficult circumstances and at very short notice again showed the great use of the system where time and economy are of importance, quite irrespective of any question regarding the possibility of a rapid variation in the position of the lights. Although the company's system has only been before the public for a few short weeks, the manner in which it has been received has already led the company to extend its factory accommodation to some large premises at King's Cross, whilst retaining its showrooms and West End workshops at 18, Dean-street, Soho.

The members of the Longton Town Council paid a visit to the gasworks last week, to inspect the water-gas plant recently erected. The manager (Mr. W. Langford) conducted the visitors through the works, and much interest was taken in the appearance and working of the water-gas plant, which occupies about one-third of the old retort-house. The works are so designed that space is left for the future extension of the new retort-house, and an additional set of water-gas plant when required; meantime the old retort-house will supply the long-felt want of a coal store, having a railway on each side for delivery, and being close to hoppers for supplying coal to retort-charging machinery. The boiler-house is built at the end of the old retort-house, and is supplied with two Lancashire boilers, 27ft. by 7½ft., fitted with Hopkinson's mounts and Wilton's forced draught furnaces, so that breeze dust may be used for firing. During the last six months a new 18in. main has been laid for the town supply from the works to the Market-square, in lieu of the 12in., which was inadequate, and on the works the old 12in. crude gas main from the new retort-house to condensers has been replaced by an 18in., and the gas connections for the new retort stack have been arranged so as to draw off the gas from each end instead of only one end as formerly, and each bed of the new house has been reset with new retorts. During the last ten years the output of gas at the Longton Corporation gasworks has increased 70 per cent. In 1896 the output was 102,368,000 cubic feet, as against 151,306,000 last year, being an increase of 48 per cent. in four years.

GENERAL.

THE King's Norton Urban District Council has decided to erect public baths.

THE Sunderland Town Council has decided to spend £27,000 in extending its tramways.

THE accounts of the Hospital Saturday Fund are now closed. The total receipts for the year were £20,222, as against £20,002 in 1899.

THE Stroud Joint Hospital Board is expecting the sanction of the Local Government Board to a loan for the purchase of a site at Hamwell Leaze for an infectious diseases hospital.

FOLLOWING the lead of other cities in the country, the members of the Health Committee of the Bradford Corporation are considering a proposal to establish a pathological and bacteriological laboratory.

THE Hongkong Sanitary Board has refused, on account of the expense, to have a cinerator there to burn up the carcases of diseased cattle and pigs. The plan of dumping such refuse on the other side of the harbour found favour.

MR. W. A. DUCAT held an inquiry at Dudley last week in reference to the application of the Town Council for the sanction of the Local Government Board to a loan of £2225 for street paving, and £460 for the purchase of a 15-ton steam roller.

WE are informed that the Southwark Borough Council has appointed three women Sanitary Inspectors at salaries of £160, £130, and £120 per annum, and has also decided to engage two women as Inspectors of Infectious Diseases at salaries of £110, rising to £160.

THE Hull Municipal Crematorium was recently inaugurated by the cremation of the body of a lady. The body was taken from Leicester. It was stated that the lady had seen a notice of the first municipal crematorium, and had expressed a wish that her body should be taken to Hull and cremated.

THE London County Council having decided to run a service of electric trams on Denmark-hill, has also deemed it necessary to widen that thoroughfare. It has accordingly approached the Lambeth Borough Council with a view to securing from that body one-third of the total cost of the improvement.

THE Lord Mayor of Leeds recently presided at the Leeds Town Hall over a meeting in connection with a scheme for the open-air cure of consumption. The open-air treatment at Farnley was highly commended, and it was reported that during the past fifteen months eighteen patients had been successfully treated there. It was proposed to establish a permanent sanatorium near Selby, on the Gatesforth estate, which has been purchased by the Leeds Corporation. The report of the Committee was adopted, on the motion of the Lord Mayor, seconded by Sir James Kitson.

AT a recent meeting of the Blore Heath Rural District Council held at Market Drayton, with respect to the recent outbreak of enteric fever at the village of Aston, the Medical Officer for the county (Dr. Reid) presented his report, which stated that he had inspected the houses in which cases of enteric fever had occurred. Most of the cottages in the village resembled those usually met with in old agricultural villages, although the conditions of some of them necessitated their being placed even lower in the scale, and it was questionable whether any measure short of demolition would meet the case. Samples of water from six of the wells had been analysed, and these were all seriously contaminated, one being little better than sewage effluent. Five of the cases which occurred in the village had a water supply in common, which upon analysis proved to be the worst sample of the lot. The surroundings generally were such that even had the water supply been satisfactory the outbreak might, with ample reason, have been attributed to the highly polluted state of the ground arising from the absence of proper drainage. The Chairman of the Council stated that on behalf of the owners an expert should be employed, and see what could be done to remedy matters, and the question was eventually adjourned until the next meeting, and the Clerk in the meantime was instructed to write to the several occupiers forbidding the use of the water for domestic purposes.

THE Grays Urban District Council is about to erect workmen's cottages, at a cost of £6400.

A LOCAL Government Board inquiry has been held at Bootle into the application of the Town Council for sanction to borrow £29,200 for fire-station purposes, £4300 for the provision of public baths and a gymnasium, £3645 for police-station purposes, £2300 for provision of a library and reading-room, £2020 for the purposes of a public assembly-room, £1764 for the purposes of street improvement.

AT a meeting of the Sanitary Committee of the Dundee Town Council last week a circular was submitted from the Local Government Board on the subject of arsenic in beer. It stated that no cases had come to the knowledge of the Board, either as to the occurrence of similar illnesses as those in England or the presence of arsenic in beer in Scotland. Indeed, they were aware that the analysis instituted had yielded negative results. The Board called attention to the danger of the presence of arsenic and glucose in the manufacture of preserves, sweetmeats, and the like. The Sanitary Inspector was directed to procure samples of these for the purpose of analysis and report.

PERSONAL.

MR. S. J. JAMES LOGIN has been appointed Sanitary Inspector for Whitland.

DR. ROBERTS has been appointed Medical Officer for Deptford, at a salary of £225.

MR. C. H. SANDERSON has been appointed Assistant Surveyor for the rural district of Clutton.

DR. J. T. MACNAMARA has been appointed Medical Officer for the Ladywell Workhouse, St. Olaves.

MR. BARRAS has been reappointed Surveyor and Inspector of Nuisances for Doncaster for six months.

THE salary of Dr. Dingle, as Medical Officer for Middlesbrough, will be increased £50 per annum from April next.

DR. D. L. THOMAS, a native of Newcastle Emlyn, has been appointed chief Medical Officer of Health for the borough of Stepney.

DR. JOHN M. MARTIN has been appointed Medical Officer of Health for Stroud, in room of Dr. Thomas Partridge, resigned.

MR. O. E. WINTER has been appointed Borough Surveyor for Poplar, and Mr. Blackman has been appointed Borough Engineer.

MR. R. L. LEGATE has been reappointed Medical Officer of Health for the Christchurch urban sanitary district for one year.

DR. CHARLES ROBERTS, Medical Officer for Uxbridge, died suddenly at Victoria Station on Thursday last from heart disease.

THE Local Government Board has sanctioned the reappointment of Dr. Kenwood as Medical Officer for Finchley for one year.

MR. W. WOOD, of Leeds, has been appointed Sanitary Superintendent for Hull, at a salary of £150 per annum, to increase to £180.

MR. A. T. MILLS, Sanitary Inspector to the borough of Bethnal Green, has been appointed by the Hornsey District Council as Building Inspector.

DR. CULLEN has been unanimously reappointed Medical Officer for the Castleknock dispensary district, under the North Dublin Board of Guardians.

MR. ARTHUR H. SHAW, of Harrow, has been appointed the resident Electrical Engineer to the Ilford Council, at £300 per annum for three years.

DR. ED. LONG JACOB has been appointed Medical Officer of Health for the urban and rural sanitary districts of Reigate, at a salary of £150 per annum.

MR. P. G. KILLICK, late Surveyor to the Clerkenwell Vestry, has been appointed the Finsbury Borough Surveyor, with Mr. Harley Heckford, late Surveyor of the St. Luke's Vestry, as his deputy, the respective salaries to be £400 and £350 per annum, with no superannuation or compensation for loss of office.

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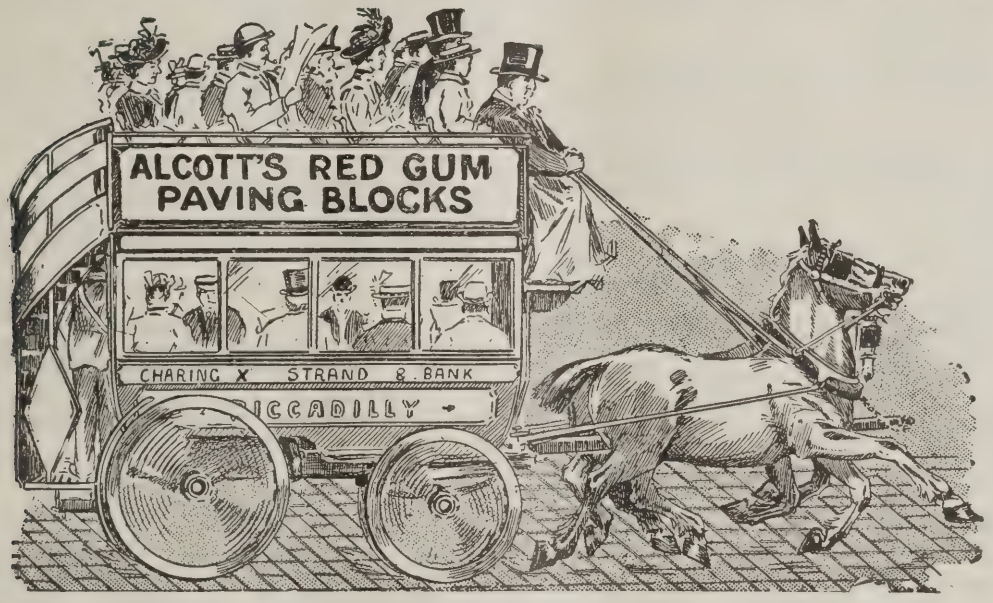

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LONDON, S.W.

Dr. G. D. Jenkins, Assistant Medical Officer, Bethnal Green, has been appointed Medical Officer for the Rhondda Valley urban district, at a salary of £500 a year.

Mr. James Weatheritt has been appointed Inspector under the Southwark Town Council to carry out the provisions of the Sale of Food and Drugs Acts, at £225 per annum.

The Local Government Board has sanctioned the appointment of Dr. John Blanchfield Keoghias as Medical Officer of the Barrow dispensary district, at a salary of £100 per annum.

The Local Government Board has sanctioned the re-appointment of Mr. Bernard Godfrey as Surveyor and Sanitary Inspector for Rotherham rural district for the year ending October, 1901.

NOTES AND QUERIES.

Subscribers may obtain advice on matters appertaining to Public Health Law and Municipal and Sanitary Engineering. Letters should be addressed "Notes and Queries," The Sanitary Record, 5, Fetter-lane, London, E.C. If an answer be required immediately, a stamped addressed envelope must be enclosed

2067.—Separate Drainage for Soil and Surface Water.—"Building Surveyor" writes:—"I note in your issue of the 4th inst., under "Cross-Table Chat," a paragraph referring to the approval by the Local Government Board of bye-laws relating to the separate system of drainage for soil and surface water. I should be glad if you would give me the name of any Authority who have had bye-laws approved with these clauses inserted."

Answer.—We find on making inquiries in official quarters that the Urban District Council of Carshalton, Surrey, have obtained an excellent series of Model Bye-laws, under which separate drainage for soil and surface water may be enforced. The same Authority's bye-laws, we understand, also contain provisions prescribing the methods of drainage of existing houses. We think it is very probable that if a courteous application—enclosing twopence in stamps for postage—were made to the Clerk or to the Surveyor to the Council, either of them would kindly furnish a copy of the said bye-laws.

2068.—Sewage Disposal: Leeds Report: Analysis of Sewage.—"Sewage Works Manager" writes:—(1) "In 'Cross-Table Chat' a few weeks ago, reference was made to the joint report of Colonel Harding and Mr. Hewson on the recent experiments at Leeds, in the bacterial treatment of sewage. Is the report obtainable from any printer, or was it issued for the Council only? I have made inquiries, but no one seems to know anything about it. Will you kindly state whether this report can be purchased? (2) Can you also inform me where the Massachusetts report is obtainable in this country, as I should much like to see it? (3) In the pamphlet on 'The Bacterial Treatment of Sewage,' by Mr. Thudichum, he states that with practice any sewage works manager might be able to analyse the sewage and effluents. Is there any book published that gives the information? What apparatus is required for the purpose? I am sorry to trouble you so much, but will endeavour to repay you by recommending your valuable journal to friends and others."

Answer.—The Leeds report on the experiments in the bacterial treatment of sewage, conducted under the supervision of Colonel Harding and Mr. Hewson, was printed for the use of the members of the Corporation, and has not been published for sale. The most important parts of the report, however, were reprinted in our contemporary, the *Contract Journal*, published at 139-140, Salisbury-court, Fleet-street, London, E.C., price 6½d. weekly, post free. The numbers containing same will be obtainable on application. The querist will probably find the recently-issued third report of the London County Council on "The Bacterial Treatment of Crude Sewage," by Professor Frank Clowes and Dr. Houston, price 2s. 3d., post free, from the office of Sanitary Record, valuable and interesting. (2) These reports are not, so far as we are aware, published for sale. In the quarterly *Journal* of the Sanitary Institute for April, 1896, price 2s. 8d., post free, will be found an admirable paper on "The Lessons to be Learnt from the Experimental Investigations by the State Board of Health of Massachusetts upon the Purification of Sewage," by Captain Sir Douglas Galton, R.E., which we can heartily recommend for careful perusal. (3) In Dibdin's "Purification of Sewage and Water," price 21s., post free, from this office, will be found information as to how to analyse sewage effluents, and a list of apparatus necessary for the purpose. It is needful, however, to point out that Mr. Thudichum advocates, in his excellent little book "The Bacterial Purification of Sewage," price 1s. 3d., only a comparatively simple, and yet valuable, method of estimating the amount of chlorides present in sewage, which may be acquired by any sewage works manager. This process must not be looked upon as a substitution for a proper chemical analysis, but as a means of testing the quality of the effluents. Chemical apparatus and solutions and tests may be obtained from Messrs. Francis Sutton and Co., chemists, Norwich. We appreciate our correspondent's recognition of the value of this journal, and his kind promise to recommend it to his friends. Our correspondents generally can greatly assist us and reciprocate our efforts on their behalf by recommending the journal to other officials, Councillors, and persons interested in sanitary work. Specimen copies for circulation among such will be sent post free on application.

2069.—Local Surveyors: Examinations and Qualifications for.—"Sergeant" writes:—"Will you kindly inform me what are the qualifications necessary for the post of Local Surveyor? I understand that there are examinations held by different bodies, some of which are more difficult than others. Please advise which is the easiest examination to qualify for Local Surveyor; and also what books to study; the periods and places at which examinations are held, and by what body? I already possess the Certificate of the Sanitary Institute for Inspectors.

Answer.—The querist is advised to obtain Boulnois's "Municipal and Sanitary Engineer's Handbook," price 15s., wherein he will find the qualifications and duties of a Local Surveyor ably and succinctly prescribed. The book is indispensable to all persons who desire to obtain the position of a Local Surveyor.

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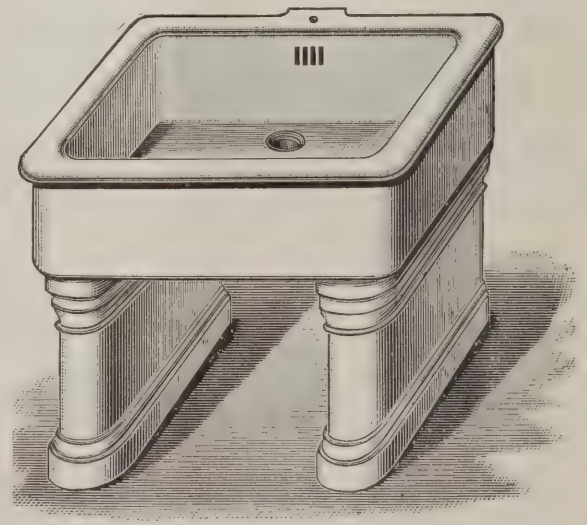

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A SUGGESTED METHOD OF PREVENTING WATER-BORNE ENTERIC FEVER AMONGST ARMIES IN THE FIELD.*

By Louis Parkes, M.D., D.P.H., Medical Officer of Health for Chelsea, and Samuel Rideal, D.Sc., F.I.C.

Everyone is aware that our troops in the South African campaign have suffered very severely from enteric fever—notably in the Bloemfontein outbreak following Lord Roberts' march from Paardeberg. Numerous questions arise in connection with this outbreak, and with the very general prevalence of enteric fever during the campaign, which we may hope to see answered when the whole conduct of the war has been under review. In the meantime, these questions may be briefly summarised as follows :—

(1) Has the number of cases of enteric fever, proportional to troops employed, exceeded that characterising other campaigns in similar climates, with similar disadvantageous sanitary surroundings?

(2) Was the likelihood of enteric fever becoming epidemic amongst the troops foreseen by the military authorities?

(3) Were the best practicable and available means taken to safeguard the army, both in stationary camps and when on the march?

The answers to these questions will be awaited with immense interest, not only by the medical profession, but by nearly every person of intelligence who has followed the various incidents of the war.

There can hardly be any doubt on the point as to whether the infection of enteric fever was introduced into South Africa by British troops, or was conveyed to the latter from pre-existing sources in the country which was the seat of warlike operations. Enteric fever is endemic in South Africa, and prevails in many parts of the country every summer season. Whereas the troops leaving England, and probably those also from India and the British Colonies, were subjected to medical inspection before embarkation, and were no doubt very free from the disease on arrival at the Cape.

It is evident, therefore, that the British Imperial forces must have become infected in South Africa by local conditions, and did not carry the disease with them from their homes. Again, it seems highly probable, from what is known of the mode of spread of enteric fever, that the first cases amongst the troops arose from the consumption of water infected with the enteric virus, derived either from the civil population with whom the troops were brought into contact, or more probably from the Boer combatants, amongst whom it is generally supposed the disease was present from their first taking the field.

Once established amongst our own forces by means of infected water, it is quite likely that the subsequent spread was largely due to personal infection from the necessarily prevailing conditions of camp and veldt life —that is to say, common latrines, uncovered and undisinfected excreta, flies carrying contagion from the excreta to the food, dust storms depositing infective material on food and drink, absence of isolation of the sick, and the want of proper hospital appliances.

Inasmuch as troops on the march are always very careful to choose camping grounds which have not been previously in use, unless strategical reasons render such a course necessary, whereas they are often dependent for their water supply on sources which have been already defiled, either by the enemy or by advance columns of their own side, the assumption would appear to be warranted that if it were possible to render all water used in drinking by the troops innocuous, there would be general development of enteric fever on a large scale, sufficient to cripple an army, such as has been the case during the present campaign.

We await information as to what has been the practical experience with the South African army of the attempts made to sterilise water for the use of troops, either by boiling or by filtration. Even now, however, it is almost safe to assume that such methods can only have a practical application at stationary camps, and are impossible of attainment during the rapid marches and swift changes of position that war conducted on modern methods necessitates.

The feature of the wars of the future will probably be, as the result of recent experience, the employment of highly mobile forces. Troops, both foot and mounted, will be expected to move with great rapidity, and with very short intervals for rest; transport will be reduced to a minimum, and the filtration or boiling of water for troops on the march will be impracticable.

BOILING AND FILTRATION IMPRACTICABLE.

We have not yet heard the full medical details of the march of Lord Roberts' army from the Modder to Bloemfontein, but it seems certain that the infantry outmarched both their regimental and brigade transport, and were dependent for their drinking water upon the polluted streams or dams which they crossed, and which in many instances had been already grossly fouled by the retreating enemy.

Even if filters or boiling apparatus can be made to accompany a rapidly-moving column, it is very doubtful if men parched by long marches performed under a fiery sun and in clouds of dust can be restrained from slaking their thirst as soon as they arrive at water. It is more than can be expected from human nature under such circumstances to await the tedious delivery of the sterilising filter, or the cooling of the water that has been heated to a boiling temperature. The agonies of thirst are intense, and at the time far outweigh any such considerations as those of prospective illness from the consumption of a germ-tainted water.

Failing, therefore, the sterilisation of water boiling or filtration, is there any substance which can be added to water which will destroy the virulence or inhibit the growth of the *Bacillus typhosus*, whilst not rendering the water unpalatable or injurious to the health of the consumer? It is evident that the ordinary poisonous—or even non-poisonous—disinfectants are inadmissible for this purpose, as if added to the water in quantity sufficient to exert a germicidal action they would undoubtedly prove harmful to the consumer, if not at first, at any rate after repeated doses.

CHEMICAL PROCESS.

There are other substances, however, which might be expected to prove beneficial as regards their effect upon *Bacillus typhosus*, whilst not harmful to the consumer. Such are the dilute mineral acids—dilute sulphuric acid, B.P., and dilute nitro-hydrochloric acid, B.P., and the organic acids, citric, and tartaric, which are largely used in the manufacture of lemonade. Other substances with which we have experimented are acid bisulphate of soda, and acid phosphate of soda, and sulpho-vinate of soda.

All of these are bodies of which the human system is tolerant, whilst in the proportions which we have found to be required (after contact of from fifteen to thirty minutes) to inhibit the growth and activity of *Bacillus typhosus*, they are quite palatable, imparting a sub-acid flavouring, which is agreeable to the taste and would materially aid in quenching thirst.

SULPHURIC ACID.

As regards previous investigation of this subject sulphuric acid has been shown by A. Stutzer to be fatal to cholera bacilli in fifteen minutes, when used in the

* A paper read before Epidemiological Society, Friday, January 18th, 1901.

proportion of five parts to 100,000 of water (0·05 per cent. solution). Hydrochloric and nitric acids are probably equally efficacious, but it does not appear that any sufficiently detailed experiments have been made on the destructibility of the organism of enteric fever.

CITRIC ACID.

Dr. Christmas, in 1892, showed that citric acid, although fatal to the cholera bacillus when used in the proportion of eight parts in 10,000 parts, did not destroy the bacillus of typhoid in a less strength than one in 1000.

Reinsch states that 0·028 per cent. of tartaric acid in water "began to diminish the bacteria, and 0·2 per cent. killed them" (*Centrabl. f. Bakteriol*, 1891, vol. x., page 415). Tartaric acid has also been employed in filters, and its use has recently been suggested in Italy for sterilising salads before consumption.

Schumberg's bromine process for purifying water (Pfuhl, *Zeits. f. Hygiene*, 1900, 53) is specially advocated for army purposes, for sterilising water in the tropics, for use on ship board, and in the case of waters derived from suspected or infected harbours. It consists in adding 0·06 grain of free bromine, dissolved in potassium bromide solution, for every litre of water. The excess of bromine is removed by adding an equivalent quantity of ammonia, which renders the water palatable. Pfuhl states that the small quantity of bromide present is entirely devoid of the possibility of injury to health, and that the taste can scarcely be distinguished from that of the water before treatment.

In July, 1897, Braithwaite suggested the use of a mixture of bromide and bromate, added to the water in the form of a tabloid, to be followed by a tabloid of acid sulphate of soda or potash. May, Baker, and Co. sell a similar mixture under the name of "bromidine," but it has not a very large sale. The quantity of bromine recommended was that obtained from two grains of bromide, or about one grain per quart, which gives only about one part in 17,500 of water. This quantity is much smaller than the authorities recommend for sterilisation. About one part in 2000 seems to be a safe quantity to use, or nine times the amount suggested above; and this would render the quantity of bromide finally formed and remaining in the water rater too high for dietetic use.

The tabular statement of Experiment I. shows that the substances therein given, when used in sufficient strength and allowed to remain for a sufficient time in contact with the infected water, are capable of preventing any further growth of *Bacillus typhosus*, when some of the infected water is agar plated.

In the case of tartaric, citric, and nitro-hydrochloric acids, it does not appear that anything less than the maximum B.P. dose per pint of water is efficient to sterilise, if the contact is not to last longer than fifteen minutes. Half the maximum dose (ten grains) per pint is inefficient in the case of citric and tartaric acids after fifteen minutes contact, whilst the minimum dose (five grains) per pint of citric acid has no effect after twenty-four hours' contact; and in the case of tartaric acid, the minimum dose did not completely sterilise after the same period. Of the two, tartaric acid appears to be the most potent in its destructive action upon *Bacillus typhosus*.

The pint has been taken as a standard, as this is the quantity of water which a man might be expected to drink off at once: one gramme to the pint is equivalent to 1 in 568.

As regards the dilute acids, nitro-hydrochloric and sulphuric, the former appears to be more efficient than the latter; but no further experiments were made with them, as it was considered essential that the substance to be carried by individual soldiers in the field should be a solid, which could be made up into small tabloids, and not a liquid, which would have to be carried in a bottle, and be measured out with some exactitude when required for the purpose of sterilising the water to be used for drinking.

EXPERIMENT I.—*750 c.c. of Tap Water Infected with One Drop of a Twenty-four Hour Broth Culture at 37 deg. Cent. of Bacillus Typhosus* (*J.*1).

Agar plate cultures made with 1 c.c. of mixture, and colonies counted after 48 hours' incubation at 37 deg. Cent.	Results obtained after contact of infected water with acid solution for periods of			
	5 mins.	15 mins.	45 mins.	24 hours
Sodium Bisulphate.				
1 grm. pt. of infected water	B. Typh. killed	Sterile	—	—
½ grm. ditto	—	Marked reduction	B. Typh. killed	—
¼ grm. ditto	—	—	No reduction	—
Tartaric Acid.				
20 grains per pt. of infected water	—	Sterile	—	—
10 grains ditto (A)... ...	Marked reduction	3 cols.	—	—
10 grains ditto (B)... ...	—	B. Typh. killed	Sterile	—
5 grains ditto	—	—	No reduction	1 col.
Citric Acid.				
20 grains per pt. of infected water	—	Sterile	—	—
10 grains ditto	Slight reduction	30 cols.	—	—
5 grains ditto	—	—	—	No reduction
Nitro-hydrochloric Acid, B.P. dilute.				
20 minims per pt. of infected water*	—	Sterile	—	—
5 minims ditto	—	—	—	No reduction
Sulphuric Acid, B.P. dilute.				
20 minims per pt. of infected water	—	Reducti'n	B. Typh. killed	—
5 minims ditto	—	—	—	No reduction

* The acidity of this solution is equal to 4·8 c.c. N_{10} Na OH per litre, and the corresponding H_2 804 solution 5·8.

SOLIDS NECESSARY.

Acid sodium bisulphate is not a B.P. medicinal substance. It probably has no purgative effect, as the astringent properties of its free sulphuric acid would tend to counteract any laxative action of the sodium sulphate. The minimum purgative dose of sodium sulphate is a quarter of an ounce, and as we only suggest the use of fifteen and a-half grains of the bisulphate to every pint of water, a man would have to drink seven pints of water before a quarter of an ounce of a salt, not known to be purgative, would be taken. Even if this quantity of water was drunk in a day, there is no evidence that a quarter of an ounce of the bisulphate would exert any harmful effect.

SODIUM BISULPHATE.

There is evidence from Table I. that the *Bacillus typhosus* is killed by only five minutes' contact with sodium bisulphate in the proportion of one gramme (fifteen and a-half grains) per pint of infected water; but in our opinion it is better that contact should be made for fifteen minutes, in order that sterility may be ensured.

(*To be continued.*)

AN anonymous donor has, through Dr. Macormack, presented a cheque for £100 to the funds of the Newport Hospital, in order to equip it with a complete set of Röntgen rays apparatus.

SEWAGE DISPOSAL IN CALCUTTA.

By A. E. Silk,

Member of the Institute of Civil Engineers, Member of the Sanitary Institute, Sanitary Engineer, Bengal.

(*Concluded from page* 23.)

CHAPTER IV.—Chemical Examinations.

The effluents and filtrates were examined periodically for (*a*) total suspended matter, (*b*) oxygen absorbed in four hours at 80 deg Fah., (*c*) albuminoid ammonia, (*d*) nitrogen as nitrites, (*e*) nitrogen as nitrates, (*f*) chlorine, the object being to compare the results obtained with this experiment with those recorded in England. Soon after the experiment was started and the first few chemical analyses had been made, it became evident that such a comparison was not possible by reason of the difference in the strength of the sewage dealt with. In England sewage amounts to as much as 30 gallons per head, consisting of bath and kitchen water, and fæcal matter and urine from water-closets mixed with from two to three gallons of water per head, the usual water-closet flush; in this experiment the sewage to be dealt with, as already explained, consisted of fæcal matter and urine mixed with only three gallons of water per head, and for a short period only half a gallon of water per head was used. It is submitted therefore that the sewage dealt with in this experiment was at least six times, if not more, as strong as the sewage disposed of in England. The results of the chemical analyses are recorded in the tables on this and next page, for comparison with English results, but with those that may be obtained hereafter in India. The analyses were made in the laboratory of the Chemical Examiner for Bengal from samples taken personally by the author, and as little time as possible was allowed to elapse between the taking of the sample and its analysis; it would have been better and more scientific if the samples could have been taken at more frequent and more regular intervals, but this was impossible owing to the author's frequent absence on tour and to the former Chemical Examiner declaring his inability to deal with so many samples with the establishment at his command were worse than crude English sewage; but in spite of what analyses may show, the fact remains that the filtrates have never caused any nuisance, nor have they shown the slightest sign of putrefaction. Towards the end of last year the experts' report on the treatment of Manchester sewage was published, and the following description of the incubator test is taken from it:—"A very valuable indication of the degree of impurity of any sewage or effluent is afforded by the so-called incubator test. To carry out this test a determination is first made of the oxygen absorbed from potassium permanganate by the sample in three minutes. A bottle is then completely filled with the sample, and closed and placed in the incubator at 80 deg. Fah. for six or seven days. The three minutes' oxygen absorption is then again determined. If any putrefaction has taken place, the oxygen absorbed in three minutes will exhibit a decided increase in amount owing to the more ready oxidisability of the products of putrefaction, such as sulphuretted hydrogen, &c. On the other hand, if the sample keeps sweet, the three minutes' oxygen absorption remains practically unchanged after incubation, or there will be a slight decrease owing to the slight oxidation of the impurities which has taken place during the period of incubation at the expense of the nitrate or dissolved air present in the sample."

The incubation test was applied to all samples taken during the present year with the following results:—

Date.	Septic tank.		Slag filter.		Cinder filter		Scott-Moncrieff filter.	
	Bef're	After.	Bef're	After.	Bef're	After.	Bef're	After.
31st Jan., 1900...	5·2	4·6	2·2	1·6	—	—	3·0	2·0
8th Feb., ,, ...	5·0	4·2	3·2	2·8	3·4	3·0	—	—
15th ,, ,, ...	7·6	6·8	—	—	—	—	—	—
20th ,, ,, ...	8·06	7·8	5·2	3·2	5·2	4·0	—	—
1st March ,, ...	6·2	5·6	3·2	2·2	3·4	2·8	14·0	13·2
8th ,, ,, ...	6·0	5·0	—	—	—	—	11·4	10·6
13th ,, ,, ...	6·8	5·2	3·2	2·2	4·8	3·8	—	—
24th ,, ,, ...	5·0	4·4	—	—	4·8	4·38	—	—
17th April ,, ...	5·8	4·9	—	—	—	—	—	—

Table D.—*Filtrate from Scott-Moncrieff Filter.—Parts per* 100,000.

	29th August, 1899.	7th Septemb'r, 1899.	14th Septemb'r, 1899.	5th December, 1899.	11th December, 1899.	8th January, 1900.	31st January, 1900.	1st March, 1900.	8th March, 1900.
Total suspended matter	8·0	7·6	7·20	10·0	11·2	10·2	11·4	14·4	15·0
Oxygen absorbed in 4 hours at 80 deg. F.	1·64	2·74	2·32	2·96	3·0	2·82	6·6	20·4	18·8
Albuminoid ammonia...	0·25	0·36	0·34	0·34	0·3	0·36	0·68	2·68	2·23
Nitrogen as nitrites	0·0175	0·70	0·35	0·682	0·7	0·525	0·4375	2·625	2·8
Nitrogen as nitrates	0·0235	0·53	0·265	0·548	0·632	0·5	0·5875	3·525	3·35
Chlorine...	5·00	Not examined.					—	30·0	31·0
	Water used, 3 gallons per head.						Water used, ½ gallon per head.		

A series of analyses taken during April and June, 1897, at the Exeter septic tank, gave the following average results:—

	Crude sewage.	Effluent from septic tank.	Filtrate. Practically.
Total suspended matter	3·5	15·4	Nil.
Oxygen absorbed in four hours at 80 deg. Fah....	2·89	2·01	0·55
Albuminoid ammonia...	0·30	0·25	0·11
Nitrogen as nitrites	—	—	0·36
Nitrogen as nitrates	—	—	0·50
Chlorine...	7·1	7·3	7·3

It would therefore appear that, from a chemical point of view, even the filtrates produced in this experiment These samples were taken when the experiment was under its most severe test, and only half a gallon of water per head was being used. The results may be considered to be eminently satisfactory, for in this case we have the actual absence of putrefaction or any sign of putrefaction confirmed by a chemical test.

CHAPTER V.—Conclusions.

It must not be concluded from the results of this single experiment described in the preceding chapters that the problem of the disposal of Indian sewage has been completely solved. It is true that the sewage of most Indian municipalities and cantonments is of a fairly uniform quality and consistency, excluding those towns, of course, where there is a water-carriage system of sewerage; and that a system of sewage disposal that suits one

TABLE A.—*Effluent from Septic Tank.* *Parts per* 100,000.

	12th May, 1899.	17th May, 1899.	22nd May, 1899.	30th May, 1899.	5th June, 1899.	12th June, 1899.	19th June, 1899.	3rd July, 1899.	24th July, 1899.	21st Aug., 1899.	29th Aug., 1899.	14th Sept., 1899.	5th Dec., 1899.	31st Jan., 1900.	8th Feb., 1900.	15th Feb., 1900.	20th Feb., 1900.	1st Mar., 1900.	8th Mar., 1900.	13th Mar., 1900.	22nd Mar., 1900.	17th April, 1900.
Total suspended matter	11·2	15·2	22·8	12·8	13·6	14·8	13·8	12·4	10·4	10·0	11·0	11·20	13·6	14·6	14·4	18·3	18·0	18·6	18·4	18·2	16·4	16·8
Oxygen absorbed in four hours at 80 deg. Fah.	5·28	4·96	5·2	7·8	5·2	4·8	4·6	5·0	4·6	3·0	2·79	3·70	3·12	10·0	10·2	16·4	15·3	12·6	12·8	12·6	11·8	12·2
Albuminoid ammonia			Results cancelled					0·44	0·50	0·4	0·25	0·58	0·4	0·95	0·96	1·3	2·8	1·2	1·4	12	1·3	1·1
Nitrogen as nitrites	0·91	0·68	0·8	0·94	0·6125	0·91	0·875	0·175	0·0525	0·175	0·035	0·012	0·035	0·175	0·2625	0·175	0·087	0·175	0·175	0·175	0·175	0·175
Nitrogen as nitrates	0·59	0·22	0·025	0·035	0·0125	0·615	0·025	0·015	0·0475	0·85	0·0675	0·07	0·17	0·03	0·1475	0·03	0·193	0·235	0·235	0·235	0·03	0·03
Chlorine	Not examined		8·0	Not examined				6·0	Not examined		5·0		Not examined		24·2	27·0	Not exmd.	32·6	35·0	27·0	Not examined	

Water used, 3 gallons per head. Water used, ½ gallon per head.

TABLE B.—*Filtrate from Slag Filter.* *Parts per* 100,000.

	18th May, 1899.	23rd May, 1899.	31st May, 1899.	5th June, 1899.	19th June, 1899.	24th July, 1899.	14th August, 1899.	21st August, 1899.	11th December, 1899.	8th January, 1900.	31st January, 1900.	8th February, 1900.	20th February, 1900.	1st March, 1900.	17th April, 1900.
Total suspended matter	18·4	17·0	16·0	12·8	9·0	7·0	6·0	7·20	8·0	7·6	8·8	9·0	17·0	10·8	7·4
Oxygen absorbed in four hours at 80 deg. Fah.	3·04	3·0	4·0	4·0	2·4	2·5	1·52	1·26	1·386	1·42	4·4	5·0	11·0	6·6	5·4
Albuminoid ammonia		Results cancelled by chemical examiner					0·16	0·15	0·15	0·18	0·51	0·48	4·27	0·7	0·5
Nitrogen as nitrites	0·6125	0·175	0·35	0·174	0·175	0·035	0·035	0·035	0·175	0·175	0·525	0·525	1·22	1·4	0·7
Nitrogen as nitrates	0·0375	0·015	0·15	0·026	0·035	0·04	0·006	0·006	0·44	0·44	0·705	0·5	5·5	2·7	0·94
Chlorine	Not examined	8·2				Not examined						23·0	Not examined	28·6	Not examined

Double filtration.

Water used, 3 gallons per head. Water used, ½ gallon per head.

TABLE C.—*Filtrate from Cinder Filter.* *Parts per* 100,000.

	12th May, 1899.	23rd May, 1899.	30th May, 1899.	5th June, 1899.	12th June, 1899.	20th June, 1899.	3rd July, 1899.	24th July, 1899.	14th August, 1899.	29th August, 1899.	5th Dec., 1899.	8th Jan., 1900.	8th Feb., 1900.	20th Feb., 1900.	1st March, 1900.	13th March, 1900.	22nd March, 1900.
Total suspended matter	6·4	14·0	8·4	7·6	10·0	7·6	8·20	6·0	7·0	7·0	7·2	8·0	10·2	13·0	11·6	10·8	10·8
Oxygen absorbed in four hours at 80 deg. Fah.	2·46	2·88	2·8	1·86	2·24	2·8	3·00	2·06	1·5	1·20	1·44	1·8	6·72	9·6	7·2	9·8	9·8
Albuminoid ammonia	Results cancelled by chemical examiner						0·32	0·25	0·2	0·20	0·2	0·2	0·59	1·17	0·74	1·0	1·03
Nitrogen as nitrites	0·45	0·175	0·7	0·35	0·45	0·175	0·035	0·35	0·0875	0·0525	0·402	0·2625	0·175	0·870	1·575	1·225	0·525
Nitrogen as nitrates	0·95	0·0125	0·05	0·025	0·05	0·025	0·04	0·04	0·1585	0·1525	0·213	0·3925	0·44	3·69	0·885	1·235	1·115
Chlorine	Not examined	6·0		Not examined			5·0	Not examined		5·0	Not examined		24·0	Not examined	29·0	28·2	Not examined

Water used, 3 gallons per head. Water used, ½ gallon per head.

town will probably be satisfactory in another. But it is rather doubtful whether sewage treated in this experiment was actually as strong, even when each stool was mixed with only half a gallon of water per head, as the sewage that will have to be dealt with in municipalities and cantonments. All that can be claimed for this experiment is that the fæcal matter of 220 people per day has been disposed of satisfactorily and with absolutely no nuisance, and that this system of disposal has been shown to be capable of dealing with a sewage consisting of half a gallon of water to every stool. It is hoped too that this experiment has indicated the lines on which future experiments may be carried out, and in this chapter endeavours will be made to make a few suggestions, based on the experiences of this experiment, for the guidance of those who are willing to make further attempts for the solution of the problem of sewage disposal in India.

In England it is found that a septic tank can break down the organic matter in sewage into simple compounds in about twenty-four hours, but, although putrefaction takes place so much more rapidly in this country and more especially in Bengal on account of the damp heat, it is probable that from seven to ten days must be allowed for, when calculating the size of the septic tank. In England, although there are hours of maximum flow of sewage, the sewage is constantly flowing; in India, however, all the night-soil has to be collected and removed in the early morning, and there is practically no collection going on during the rest of the day. This may mean that a whole day's produce of sewage would have to be rushed into the septic tank in a few hours. It is, however, one of the essential points that the liquid in the tank should not be violently disturbed, and consequently that the rise and fall of the surface of the liquid should be as small as possible; this will keep the scum, which is the breeding and collecting ground of the anaërobic microbes, fairly intact. The work of the anaërobic microbes was completely paralysed by violently shaking a bottle containing a sample of crude sewage which up till then had been undergoing the breaking-up process in a perfectly normal manner. The arrangements therefore for introducing the sewage and withdrawing the effluent must be made in accordance with these conditions. The greatest possible care must be taken in commencing work with a septic tank, and it must be remembered that to start off with the full daily supply of night-soil will mean disaster. Probably the best procedure is to fill the tank full of water and then start feeding in night-soil and drawing off the liquid, but the feeding must be done with gradually increasing quantities, say one-eighth of the full supply for a week, then a quarter for the next week, and so on. It has already been stated that the accumulation of the gases of putrefaction in the septic tank did not give any trouble, and also that perhaps provision for drawing off the gases might prevent the evolution of sulphuretted hydrogen at the outlet; any valve that is provided must be of the non-return pattern, so as to prevent air being sucked into the tank as the water-level therein falls.

The effluent as it leaves the septic tank is devoid of all oxygen in solution; every opportunity should therefore be taken of forcing air into it before it reaches the filters either by letting it fall down a series of small steps, passing it through perforated trays, &c. &c. The arrangements for sprinkling the effluent on to the filters are becoming more varied and more numerous every day.

In fixing the area of the filter beds it may be assumed that it requires 1 square yard or 9 square feet for every 200 gallons where the effluent is run straight through the beds and not kept in contact with the filtering material; one extra bed should always be provided, so that each filter may get periodical rests. If it is decided to adopt the contact system, it may be assumed that each filter-bed will hold liquid equivalent to 30 per cent. of its cubical contents, that is to say, if a filter-bed holds 100 cubic feet of filtering material, it will, when in full working order, be able to deal with 188 gallons of effluent at each time of filling. The English cycle for filtration by the contact system is two hours for filling, two for resting full, two for emptying, and two for aërating, or eight hours in all; each filter is thus used three times a day, so that with this cycle there must be at least three filters with one as a stand-by, or four in all. It is not at all certain whether, when great purity of the filtrate is required, it will not eventually be necessary to have multiple filtration, but in most places this will be rather a difficulty on account of the want of fall; it would, however, be quite feasible in the hills and may be found absolutely necessary, for the sewage will be strong and there will be nothing to compensate for this in the matter of high temperatures.

The final outfall or point of discharge is a matter for consideration, but does not carry with it so much importance as is the case in England. Many of the inland towns of England discharge the effluents from their so-called purification works into small brooks or streams, and some comparatively large rivers, both of which form in many cases the sources of the drinking supply for towns lower down. Only the liquid portion of the London sewage is discharged into the Thames, while the resulting sludge, containing 90 per cent. of moisture, is carried out to sea in steamers. Now in India circumstances are somewhat different, and it is as well perhaps that they are so, seeing what the strength of the sewage is. We have first of all the enormous rivers of India, containing at all times of the year vast bodies of water in motion, and always ready to quickly purify, by oxidation, any organic matter that falls upon it; then we have the rivers which only flow full during the rains, but whose sandy beds are natural filters; there are also small *nalas* or drainage channels, whose beds are so dry during the dry weather that they will readily absorb any quantity of liquid; tanks too are available as receptacles for sewage filtrates, as has been shown to be the case in the experiment herein described. These are all outfalls which are available for carrying off the liquid constituents of sewage that has been decomposed and filtered, and it remains to be seen whether the masonry drains that run at the sides of municipal streets could be utilised for carrying off not only the filtrates from the filters, but even the effluent from a septic tank before filtration, for such an effluent is probably not more impure than the other liquid contents of the drains. Then last, but not least, we have the sun and wind, which seem to have much greater purifying effects in this country than they do in colder climates, more especially when the matter to be purified is kept in motion.

If, then, we have these tremendous natural advantages in the matter of outfalls, it would seem to be superfluous to attempt to set up a chemical standard of purity for the effluents and filtrates. The Local Government Board of England have more than once been asked to lay down a standard of purity for sewage effluents, but they have refused, on the ground that all the circumstances of each case should be taken into consideration. Practically all that we require to do in this country is to dispose of our night-soil in an inoffensive and cheap manner, and no standard of chemical purity can help us when our senses of sight and smell are offended. The present tests that are employed are those that were originally devised for the analysis of water to ascertain whether it had been polluted; all of them, therefore, are most delicate tests, and quite unsuited to such a gross material as sewage, about the pollution of which there can be no question. Then, too, some of the tests are unsuited to this country; the oxygen absorbed and incubator tests may be taken as instances. These tests have to be carried on in a normal temperature of 80 deg. Fah., which was probably taken as being the summer heat in England, when putrefactive changes occur

most rapidly; in Calcutta, at any rate, the temperature for these tests ought undoubtedly to be the maximum temperature in the shade during the hot weather.

In consideration, therefore, of the very unequal results that have been obtained by the chemical analyses of samples of effluents and filtrates from this experiment, and of the evident unsuitability to this climate of the various chemical tests and methods in vogue in England, it has been decided to carry out a fresh series of tests during the cold season. In the meantime some of the leading chemical analysts in England will be consulted, and the difficulties of chemical work in this country explained to them.

Finally, can the septic tank system be worked by native agency? As long as the author was in Calcutta the experimental works were visited daily and sometimes twice a day, but owing to his other duties he frequently had to leave Calcutta on tour, and he was thus away for the whole of September and October. The working of the septic tank and filters was left, during such absences, in charge of a native overseer and two prisoners; on his return, after the long absence, at the beginning of November, the author found the work going on just as evenly and smoothly as when he was able to attend to the matter daily. The author is therefore of opinion that the septic tank system is undoubtedly a satisfactory method of disposing of sewage when a small supply of water of about half a gallon per head is available, and that probably it will be found equally satisfactory when the quantity of water per head is even less. The experience of the septic tank system of disposal in the Presidency Gaol has shown that the necessary structures may be placed in close proximity to crowded thoroughfares without causing any nuisance or offence, and that the system can be worked by native agency.

THE HOUSING OF THE POOR.

MEETINGS AND MOVEMENTS.

Movement to Abolish Slum Dwellings at York.

A LARGE number of ladies and gentlemen interested in the health and progress of York met by invitation of the Lord and Lady Mayoress (Alderman and Mrs. Purnell) at the Mansion House, and decided to form a new local society, to be know as the "York People's Homes Association." The object in view is akin to that which has for some years past prompted action on the part of other and larger towns where slum dwellings exist as a standing menace to the health of the community. The prime movers in the scheme desire to improve the sanitary conditions of the lowest quarters of the city, and bring into operation some really satisfactory system for the better housing of the poor. About 14 per cent. of the population of York are among the humblest of the small wage earners, residing mostly in the oldest, meanest, and most congested parts of the city, and the death-rate in the worst of those districts—Hungate—frequently approaches 40 per 1000 per annum. The York Corporation has not yet adopted the Housing of the Working Classes Act.

Northamptonshire County Council.

SPEAKING at a meeting of the Northamptonshire County Council on the question of reform in the law relating to insanitary dwellings and insanitary areas, the Marquis of Northampton referred to the recent speech of the Home Secretary. He said that a committee on this subject, on which he formerly worked with Mr. Ritchie, went thoroughly into the problem. The real question was practically this. Certain lands which had insanitary dwellings possessed a very high market price, and in order to acquire them the market price had to be paid. In these cases the ground landlord obtained three or four times more rent for his land than any artisans' dwellings company would be prepared to pay for it in order to erect proper dwellings for the working classes. The ground landlord was placed in the position of choosing whether he would consult the interests of himself and his successors, or whether he should give as charity his land for a certain purpose. The question would have to be settled, sooner or later, "Who is going to pay the difference between the market value of the land and the sum the land must be acquired at for working-class habitations to be built upon it at rents within the reach of the working classes?" It introduced the great question whether the State or the municipality should pay the difference, or whether the condition of affairs should go on as it at present existed.

Lecture at Tamworth.

AT a lecture given at Tamworth by Mrs. O. M. Aldridge (National Housing Reform Council), under the auspices of the Educational Committee and the Women's Guild of the Co-operative Society, Dr. H. J. Fausset presided over a large attendance. Mrs. Aldridge, who is a very fluent and ready speaker, denounced the back-to-back system of dwellings for the working classes as being the most insanitary of any class of houses. Taking the lowest possible standard, she stated that every house should contain at least three bedrooms, with a good kitchen, and a cheerful sitting-room. She advocated the erection of modern dwellings by Town Councils and co-operative societies, but pointed out the absurdity of electing upon Town Councils the owners of dilapidated cottages and other slum properties, as such men would do all they could to make the Housing of the Working Classes Act inoperative. She urged that model dwellings, when built under the Act, should remain the property of the Local Authority, and should not be sold to individuals. There was a strong current of Socialism running all through the lecture, which, however, was not devoid of humour, and was illustrated with limelight views, which revealed startling contrasts between the homes of the poor and the mansions of the nobility.

A LOCAL Government Board inquiry was held at Bournemouth last week with respect to the application to extend the Borough boundaries so as to include the parishes of Winton, Pokesdown, and Southbourne, which would more than double the existing area, and add 13,000 inhabitants to the borough. Opposition was offered by the Pokesdown and Christchurch Authorities.

BATH AS A HEALTH RESORT.—The Town Clerk of Bath writes: "The present season at Bath, far from being a bad one, or giving rise to any grumblings in this respect, promises to be one of the most successful ever experienced. The receipts at the baths for the past three-quarters of the financial year, which ends in March, exceeds by £750 those for the corresponding period of 1899, while there has been an increase in the number of baths given of nearly 7000. In 1870 the income at the baths was considerably under £2000—or, to be precise, £1854 18s. 5d. By the year 1880 they had risen to £2717, and in 1890 to £6543 17s. 10d. In the previous year they totalled as high as £7000, this rapid rise being due to the enlargement of the King's and Queen's baths, when a new wing was opened by the Duchess of Albany, in which was installed a complete and up-to-date system of continental treatment. Since that time Bath has well maintained its position, and there is every likelihood of the receipts of the present year, ending with March, constituting a record."

ARSENIC IN BEER.*

CIRCUMSTANCES WHICH LED TO THE INQUIRY.

At a meeting of the Sanitary Committee held on December 1st, 1900, I called attention to an extensive epidemic ailment attributable to the presence of arsenic in beer which had occurred chiefly in Manchester and the neighbourhood, and pointed out that there was reason to fear that this county had not escaped.

The first circumstance which excited suspicion among medical men was the occurrence, during the preceding few months, of a phenomenal increase of cases of peripheral neuritis, an affection which is usually met with among persons who are addicted to alcoholic excesses, especially spirit drinkers.

To Dr. Reynolds, Assistant Physician to the Manchester Royal Infirmary, and Visiting Physician to the Manchester Workhouse Infirmary, the credit is due of first recognising the true nature and cause of the malady. Having had occasion to treat numerous cases at both infirmaries, it became apparent to Dr. Reynolds that while most of the signs and symptoms of alcoholic neuritis were present, other symptoms presented themselves in most of the cases which were not characteristic of that disease, but which were characteristic of arsenical poisoning. He and others also observed that the large majority of the patients then suffering from peripheral neuritis were beer drinkers, and this led him to suspect beer as being the vehicle of the arsenic. His suspicions having thus been roused, Dr. Reynolds analysed certain samples of beer sold in Manchester, with the result that, on November 18th, he found a "considerable amount" of arsenic in the samples. The presence of the poison was subsequently confirmed by himself and others, and thus, through the publication of the facts in the press, on November 23rd, the scare arose which has led to this and other inquiries.

The source of the arsenic was at first a mystery, but in course of time it was conclusively traced, in the first instance by Professor Delépine, of Manchester, to the use of contaminated glucose, and as the investigations proceeded, evidence soon began to accumulate which pointed to the conclusion that one firm only were responsible for the manufacture of the arsenical glucose, a conclusion which has since been amply confirmed; I may say at once that the firm in question were Messrs. Bostock and Co., Liverpool.

In the Report of our County Analyst upon the chemical aspect of the question, which is embodied in this Report, the Committee will find a concise statement regarding the process of manufacture of glucose, which clearly explains the source of the arsenical contamination.

HOW THE INQUIRY WAS CONDUCTED.

The Committee having approved my suggestion that the matter should be specially inquired into, and having passed a resolution instructing the Inspectors under the Sale of Food and Drugs Act to curtail for a time the routine work and devote their attention to the collection of samples of beer and brewing materials to be tested for arsenic only, no time was lost in getting to work.

As time was of importance, I immediately invited the co-operation of the Medical Officers of Health of the various districts of the county, including county boroughs, to whom I addressed a circular-letter setting forth the sort of information I was desirous of obtaining, and enclosing a printed sheet of questions. The immediate object I had in view was to locate any cases which might have occurred in this county, and to ascertain, if possible, the source of the implicated beer. To have attempted to obtain this information by a direct appeal to every medical practitioner in the county would have involved considerable delay, and such an appeal, I feel satisfied, would only have met with partial success. On the other hand, previous experience having taught me that I might rely upon the willing help of local Medical Officers of Health, I did not hesitate to seek their assistance. They, of course, both from their own experience as medical practitioners and because of the facility with which they could directly ascertain the experience of their fellow practitioners, were in a position to supply the needful information with less delay and with greater fulness than would have been possible had I adopted the alternative method of a direct appeal to every medical practitioner. At the same time, I did not entirely confine my appeal for information to Medical Officers of Health, as it appeared to me that, supposing there was substantial ground for alarm, many cases would probably be met with among the large class of persons who habitually seek hospital treatment. Accordingly, I decided to communicate direct with every medical man engaged in hospital practice throughout the county.

I am pleased to state that very full information soon reached me as the result of both appeals. In the course of a few days every Medical Officer of Health, including those of county boroughs, had filled in and returned the circulars, as had also most of the medical members of the hospital staffs, and I was thus in possession of information, not only as to the localities where cases had occurred, but also, in many instances, as to the suspected sources of the arsenical beer. At first the Inspectors had no information to guide them in the collection of samples, but as the returns referred to came in, I was able to make suggestions from day to day as to how they might best direct their movements with the view of securing the fullest possible value, in the shape of pertinent information, in return for the time and labour involved in the collection of samples and in the analytical work.

EXTENT OF INJURY TO HEALTH.

It is impossible to gauge, even approximately, the amount of injury, from a health point of view, which has resulted from this wholesale poisoning by arsenic in the Midlands, but it is likely that many have suffered in a mild degree who either did not seek medical assistance or the cause of whose illness was not recognised. Again—leaving out of consideration the misery which must have resulted from thousands of people being incapacitated from work for long periods—it is not unlikely that, among those who have suffered most, organic changes may have resulted which will cause a permanent impairment of health sufficient to partially, if not entirely, prevent them from following their usual occupations, and lessen their chance of recovery in the event of serious illness in the future. In all probability, also, fatal cases have occurred which, before the true nature of the illness was discovered, were attributed to alcoholic neuritis.

Another consideration which occurs to me is, how long may not poisoning from arsenical beer have been going on, in a milder and unrecognisable form, owing to the use of less seriously contaminated glucose? Supposing that impure sulphuric acid was not used for the first time some months ago in the preparation of glucose, then it is more than likely that mild cases of poisoning did take place, and that it was only when an exceptionally contaminated acid was employed that the quantity of arsenic in the beer was sufficient to make its presence apparent in so alarming a manner.

So far as I can discover from available records, arsenical poisoning on such a scale as this has not previously occurred in England, but, in 1888, as described by Berthélemy, 405 cases of poisoning occurred at Hyères, owing to a mistake on the part of a wine merchant who poured a solution of arsenic into wine

* Abstract from Report of Dr. Geo. Reid, County Medical Officer, Staffordshire, January 16th, 1901.

casks. The symptoms as described in these cases corresponded with those observed in the beer poisoning cases, and I may here mention that it has been suggested that alcohol, being also a neurotic poison, may increase the toxic effect of arsenic.

NATURE OF ILLNESS.

At this point it may be convenient to refer, very shortly, to the nature of the illness from which the patients suffered, as the Committee will then be able to appreciate why it was so difficult to arrive at its true origin.

Whatever the explanation may be, it would appear that the cases in this county, on the whole, have not been so serious as those which have occurred in Manchester and adjoining districts, and I have no official information of any deaths having occurred, although some patients have suffered, and are still suffering severely.

For the following summary of the symptoms usually met with I am indebted to the very full descriptions of cases in articles communicated to the medical journals by medical men practising in districts where they have mostly occurred, including Staffordshire; I have also personally observed the symptoms of patients whom medical practitioners have been good enough to afford me an opportunity of examining. I merely give the prominent ordinary symptoms, and I have avoided technicalities:—The first signs and symptoms to make their appearance are usually dyspeptic troubles, headaches, and irritation of the eyes, accompanied by a puffy condition of the lids and a watery discharge. The feet are swollen and tender, and there is a feeling of burning and tingling, so much so that patients insist upon keeping them uncovered; in many cases also, apart from paralytic trouble, patients are unable to walk on account of this tenderness. In many cases there is tenderness on pressure of the calf, and in the severer cases there is paralysis, more or less complete, chiefly of the arms and legs. Various affections of the skin are met with which cause great irritation, and sometimes sores of various kinds cause considerable uneasiness, but the most characteristic skin affection is a hardened and scaly condition, especially of the hands and feet. Pigmentation or darkening of the skin is also frequently found on various parts of the body, including the face. This pigmentation, however, does not seem to have been so constantly met with in the Staffordshire cases as in those which occurred in Manchester and the neighbourhood. The circulation is feeble owing to weak action of the heart, and in some cases, although by no means in all, there is a rise of temperature.

Now, had the symptoms just enumerated been characteristic of arsenical poisoning only, the true nature of the phenomenal epidemic would not for so long have been overlooked, but, considering the fact that with the exception of the pigmentation of the skin —which is characteristic of arsenical poisoning, but which is not present in all cases, and is frequently only apparent when carefully looked for—all the symptoms are common both to the well-known ailment alcoholic peripheral neuritis and arsenical poisoning, it is by no means surprising that the true nature of the cases should have remained undiscovered for some months.

Dr. Reynolds, who, as I have already stated, was the first to throw light upon the mystery, had his suspicions aroused by observing pigmentation in several of his cases, and by noting that the cases occurred among beer drinkers and not among spirit drinkers, as is usual in the case of peripheral neuritis.

POISONOUS DOSE OF ARSENIC.

From the County Analyst's report it will be seen that the amount of arsenic, in the form of arsenious oxide, present in the beers, varied from under $\frac{1}{20}$ grain per gallon to just over $\frac{1}{2}$ grain.

Arsenic may give rise to poisonous symptoms when taken in one large dose or in continued small doses. Also, a dose which may cause symptoms of poisoning in one person may be taken with impunity by another—in fact, there are few drugs which act more diversely upon different people—and even when taken in medicinal doses, if continued for some time, arsenic not infrequently gives rise to symptoms which may become serious unless its use is discontinued.

The medicinal dose of arsenious oxide is from $\frac{1}{60}$ to $\frac{1}{12}$ grain, and, bearing in mind that some of the samples of beer contained as much as $\frac{1}{2}$ grain per gallon, it follows that a little over one pint of such beer contained the maximum medicinal dose of the drug. Probably the majority of people might take more than this amount, for a period, without injury; but in view of what I have just stated, and considering the fact that thousands of people must have been drinking arsenical beer daily, one may reasonably conclude that among these there must have been a considerable number of persons who were hypersensitive to the drug. This being the case, then, and supposing that only from one to two pints per person per day were consumed, one would not be surprised to meet with symptoms of, at least, mild arsenical poisoning. If, on the other hand, for pints we substitute quarts—which in all probability would be a truer estimate of the actual consumption among the class who have suffered—then, as the quantity of arsenic taken daily would much exceed the maximum medicinal dose, the recent calamitous experiences would at once be accounted for.

(To be continued.)

A TEST FOR EFFICIENT PASTEURISATION OF MILK.

How can it be seen or demonstrated on a sample of milk whether it has been sufficiently heated or not? This is, strangely enough, a very simple matter. In the year 1889, Professor Babcock, of Wisconsin, showed that when hydrogen peroxide was added to natural milk it was split up into water and free oxygen, while milk which had been previously boiled had no such effect. Later investigations have proved the presence in milk of an unorganised ferment, or enzyme, to which this reaction is due. This enzyme is destroyed by being heated to a temperature of 176 deg. Fah. It is found in all milk, and in the products of milk, viz., cream, separated milk, butter-milk, and whey, so long as these have not been heated to 176 deg. Fah. or over; it can even be demonstrated in butter provided this is made from cream which has not been heated to 176 deg. Fah., or over. The addition of one drop of a diluted aqueous solution of hydrogen peroxide to a spoonful of fresh milk will produce free oxygen, and the presence of this can be easily demonstrated by adding a few drops of a solution of one or other of the many chemicals which change colour perceptibly in the presence of free oxygen, preferably potassium iodide and starch or paraphenylendiamin. Two drops of an aqueous solution of the last-named reagent produce, in this way, a dark indigo-blue colour in milk when it has not been heated above 176 deg. Fah. If the milk has been previously heated, no change of colour takes place when one drop of hydrogen peroxide and two drops of paraphenylendiamin are added. Supplied with a small bottle of each of these reagents and a small test-tube, all of which can be had for a few pence, anybody can in a few minutes tell whether milk has been heated to the named temperature or not.

A HOSPITAL for infectious cases is to be erected jointly by the Rochford Rural District Council and the Shoeburyness Urban District Council.

CORRESPONDENCE.

(We do not in any way hold ourselves responsible for opinions expressed by our correspondents.)

(To the Editor of THE SANITARY RECORD.)

THE ARTIFICIAL COLOURS IN SWEETS.

SIR,—One cannot, after receiving and examining a great number of sweets, help being struck with the abnormal and artificial stage at which the manufacture has now arrived.

If the embellishment of our babies' bellies, or the ornamentation of the stomachs of adults with gorgeous colours was the *summum bonum* of confectionery, one could better understand the state of affairs now reached.

The good old-fashioned wholesome toffey-candy, hard-bake—bulls' eyes—liquorice barly sugar, and so forth, are placed upon a back shelf, and mixtures of goodness knows what are adorned with tints of the rainbow, and placed in a conspicuous position in every sweet shop.

Possibly this has been going on so long that neither the manufacturers nor the vendors can help themselves, and the cry is, "We cannot sell our goods if not bright and attractive to the eye."

If that is so it is time that the Sale of Food and Drugs Acts should be put into operation to suppress any and all forms of artificial colouring in foodstuffs.

ARTHUR ANGELL,
January 17th. *Public Analyst.*

A CLEAN BILL OF HEALTH.

SIR,—I am obliged to Mr. Irwin for the information he gives concerning Ramsey, in answer to my letter in your issue of the 10th inst., about Penmaenmawr, and I am sure that he and those associated with him in the betterment of that pretty watering place deserve well for the improved sanitary conditions which there obtain.

It would, however, appear that Mr. Irwin did not carefully read my letter before writing his reply. The total absence of zymotic mortality in one year, *i.e.*, from January to December inclusive, the period covered by annual health reports, and immunity from any infectious sickness in the next, in the same urban district, is the rare circumstance recorded of Penmaenmawr, not its freedom from infection between any two dates. If I had wished to convey this I would have stated that the district has been wholly free from infectious disease from August 27th, 1899, to the present time, almost 17 months; and it continues so—a better record still. The coincident case, which interrupted a previous period of freedom, was a mild imported "suspected" one, but as it was notified it was accepted as such.

It is an axiom in district hygiene, as in other departments of public work, that it is easier to make bad good than good better, in practice largely because of the anomaly that the more successful sanitary measures are the less apparent becomes the need for them. The conditions of Penmaenmawr as a health resort have always been good, but they would now seem to be better; and negative quantities will apparently be required wherewith to compute further improvement! The mutual relationship of cause and affect appears to have had singularly speedy confirmation in the fact that the past two years have witnessed the completion here of comprehensive works of water supply and drainage, the institution of a regular system of scavenging, and the erection of a large number of well-equipped houses for the industrial population.

Information as to similar conditions elsewhere, if such exist, will yet be welcome.—Yours faithfully,

Penmaenmawr, ERNEST WORRALL.
January 19th.

THE CUP OF THE SACRAMENT.

SIR,—From time to time letters have appeared in sanitary journals relative to the present method of administering wine to the people in the ceremony of the observance of the Supper of our Lord. The danger of the present system of so doing has not, however, been sufficiently emphasised.

For the last sixty years sanitarians have laboured energetically, and with beneficial results, to instil into the lay mind some thought as to the means by which it may in the ordinary daily round protect the body from the many snares which lie in wait for it, and which are too often successful in obtaining hold upon the careless, and often with disastrous and fatal effect. These efforts have been primarily in connection with our domestic sanitary arrangements, and secondarily with the many opportunities of reducing risk to health in our every-day life in the world.

The subject under review is obviously in the second class of these great measures of sanitary reform. That the efforts of sanitarians have been successful is conclusively proved by the great decrease in the percentage of preventable diseases, and this success is greater than would appear at first sight when we take into consideration the increase of population in our large towns, with the consequent necessary restricted area for habitations—a condition of things which would be absolutely impossible were it not for the very laudable improvements in our sanitary arrangements and in the conduct of the details of our daily life, due entirely to those once-despised sanitarians, who are, I fear, not appeciated in some quarters even now at their full worth.

Now, these same sanitarians, not content with invading the domestic hearth, nor with penetrating into the inmost recesses of the factory and the workshop, and saying, "This thing must not be," or "That practice must cease," as occasion may demand—not content with purifying rivers and improving hospitals and kindred works, are now bold enough to attack the Church, and that in one of its most sacred services—the holy Sacrament.

Our clerical friends will doubtless be astounded at such audacity, and object to any attempt to dictate to them about the management of the details of their services, and I may say at once that from a sentimental point of view I quite admit that the system I am advocating has its drawbacks, but at the same time we cannot conscientiously allow sentiment to hinder sanitary reform.

Undoubtedly—and I say it with all emphasis—the present custom of numerous people of different ranks, habits, and habitations, drinking out of one cup is most dangerous and therefore most reprehensible, and it should be stopped with the least possible delay.

I admit that this will not be accomplished without much difficulty, as not only our clerical friends, but the majority of the worshippers in our churches, are so attached—and, with the exception of the practice under discussion very rightly so — to every detail of the services, that we may expect to hear many bitter attacks upon our latest contention; and it will probably be years before our efforts meet with success and one more sanitary reform has triumphed.

We shall be told that our Lord will surely protect His children in the act of worship, and that notwithstanding the nineteen hundred years that have passed since the institution of the Sacrament, the ceremony should still be carried out exactly in the same way now as then. I anticipate this argument, and we would point out that it will not endure any consideration; years alter our habits naturally and necessarily, and what was done nineteen hundred years ago is not done now.

If the Lord's people are to be specially protected in His church, why not in their own houses—why not in

the streets? In short, why trouble about sanitation? It would not appear to be necessary. I may mention that the clergy themselves have conduced to this appeal. They are provided with a chalice napkin for the purpose of wiping the cup after each user, but very few avail themselves of this, and the omission has been severely commented on by many.

I call upon all sanitarians, and in fact on everybody with common sense, to decline to encourage this careless infringement of ordinary precaution by insisting upon small cups being provided in the churches they are connected with.

This system would in no way detract from the solemnity of the service, and would be one more point gained in the direction of sanitary reform.

In conclusion, I may mention that I have already been met by the argument that in some churches hundreds of cups would be needed. That such an argument can be raised is to accentuate the urgent necessity of immediate alteration in the present system. — Yours faithfully, WALTER MARKHAM.

79, Essex-road, N.

TUBERCULOUS DISEASE OF COWS.

SIR,—I should feel obliged to any of your readers who can give me information on the following points. By an order of the Local Government Board of March 11th, 1899, it is directed that "such disease *of the udder* as shall be certified by a veterinary surgeon to be tuberculous" shall be deemed to justify the stoppage of sale of milk, &c. (I need not quote more fully).

I should be glad to know whether, and under what statute or order, a district Council have power to cause the application of the tuberculin test, in such manner, and with such safeguards as to eliminate the many known causes of possible error attendant on the use of this test, or to cause it to be used at all.

Whether I am right in supposing that the tuberculin test properly applied will show whether or no the cow is suffering from tuberculosis, but will not indicate the organ or organs affected.

Whether there exist any other means whereby a veterinary surgeon can ascertain with certainty the presence or absence of tuberculosis, slight or severe, in the udder of a cow; and what guarantee has the Council employing him that he may not fail to detect the disease in some or many cases.

Assuming that there may be some cases that could be certainly detected without the use of tuberculin, what would be the percentage of such cases likely to be so detected in ordinary cows on a farm passing most of their time turned out to graze?

What would be the position of the District Council as to liability to damages in cases where the veterinary surgeon might from imperfect knowledge of the law exceed his legal powers, or through avoidable causes (as error of diagnosis), inflict loss or injury on the cow-keeper. QUI HI,

Member Sanitary Institute.

January 21st, 1901.

LAW CASES.

Infringement of Infectious Diseases Notification Act.

AT Chester-le-Street, Dr. J. A. Irvine, Fatfield, was charged at the instance of the Rural District Council with offences under the Infectious Diseases Notification Act, on October 20th and 22nd, and on November 5th. Mr. H. E. Ferens (Durham), who prosecuted, said Dr. Taylor, the Medical Officer of Health of the Chester-le-Street Rural District Council, discovered that in the months of October, November, and December there were several cases of scarlatina in the district which had not been notified, as required by law. All of them were under the medical attention of Dr. Irvine, whose duty it was to notify the Medical Officer of Health of the existence of the cases. Mrs. Mary Jane Bell, Post-office-row, Fatfield, said her daughter Grace died on October 24th. She was taken ill on October 15th, and attended by Dr. Irvine. He said she was suffering from scarlatina, and he would have to report it. Barbara Robson, Fatfield, said her granddaughter was taken ill in November, and witness sent for Dr. Irvine. He came and said it was a case of scarlatina.

After other evidence, the Bench fined the defendant 20s., and costs in each case, the costs to include witnesses' costs.

Removal of a Fever Patient.

AT Lanchester, Robert McDonald, miner, of Quebec, was summoned under the Public Health Act for obstructing a magistrates' order for the removal of his child to the Infectious Diseases Hospital at Langley Park.

Mr. W. LISLE, who prosecuted on behalf of the Lanchester Rural District Council, stated that the defendant's boy, who was suffering from scarlet fever, was ordered to be removed to the hospital, there not being sufficient accommodation in McDonald's dwelling to isolate the patient. Sergeant Gillespie, along with Mr. Halkier, the superintendent of the hospital, went to the defendant's house with the ambulance van to remove the lad, but McDonald declined to allow the child to be taken away. The child was still lying in the same room, and was recovering from the disease.

Mr. CORKE (from the office of Mr. Edward Clarke, Newcastle) defended, and pleaded guilty. What he complained of was that the order was obtained on *ex parte* statements. He contended that there was ample accommodation for the isolation and nursing of the patient. Defendant had done all he possibly could to prevent the disease spreading, and had even stopped off work from the pit.

The magistrates said though, as the law stood, they were obliged to convict. They quite agreed that it was very hard for the defendant to be precluded from obtaining a hearing on the question of accommodation at the local law courts if he had a good defence. His only remedy, if an order were obtained on an *ex parte* application was obstruction and appeal to the Court of Queen's Bench. They must convict, and they fined the defendant 5s. and costs.

A LOCAL Government Board inquiry was held recently into the application of the Manchester Corporation to borrow £12,500 for laying out Brookdale Estate, Newton Heath. The estate was recently purchased by sanction of the Local Government Board for £26,500.

THE Local Government Board has decided on despatching a Medical Inspector to the several Irish boroughs and having reports from the Inspectors as to the working of the Sanitary Act in the principal Irish cities. These reports will be subsequently printed and issued in Blue-book form, following the procedure in England. Last week Sir J. Atcheson M'Cullogh, Local Government Board Medical Inspector, arrived in Limerick, and was engaged in a private sanitary inspection of the borough. By a curious coincidence it was stated at the Corporation meeting that though the outlay on the cleansing of Limerick was £8000 a year, or one-half the total city revenue, the streets and thoroughfares were in a most unsanitary condition. No meeting of the Cleansing Committee had been held for weeks.

OBITUARY.

DR. A. N. COOKSON, NUNEATON.

At Nuneaton on Sunday night, the 6th inst., the death occurred of Dr. A. N. Cookson, the oldest medical practitioner in that town, and brother of Dr. Samuel Cookson, of Stafford. He had for some time been in failing health. He settled at Nuneaton many years ago, enjoyed a large practice, and held the appointments of Medical Officer and Public Vaccinator of the Nuneaton Rural District. Dr. Cookson leaves a widow and one son.

DR. SEDGWICK SAUNDERS.

It is with sincere regret that we have to announce the death from inflammation of the lungs of Dr. Sedgwick Saunders, Medical Officer of Health and Public Analyst to the Corporation of London. Dr. Saunders was born in the year 1824 at Compton Giffard, near Tavistock, Devon, where his ancestors had resided for many centuries. He was educated at King's College, London, and at the age of nineteen commenced his medical career as a student at St. Thomas's Hospital. St. Thomas's, it may be mentioned, is one of the Royal hospitals over which the Corporation exercises jurisdiction. Consequently it may be said that his association with the City commenced even at that early period of his career. His hospital course was a notable one, and when he left to commence practice in the year 1846 he carried with him many of the principal prizes of the medical school. Preferring an adventurous career to what he considered the humdrum life of a private practitioner, the Doctor entered the army as an assistant surgeon, being gazetted to the Royal Fusiliers, with whom he served in the West Indies and North America. Returning four years later to England, he was placed on the staff, receiving an appointment as Medical Officer at the Military Prison, Fort Clarence, Rochester. In 1851 he was ordered to the seat of the Kaffir war, sailing in the ill-fated Birkenhead in January of the following year. What at the time seemed to be a great misfortune proved, as a matter of fact, the saving of his life. When a few days out he was seized with illness, the symptoms proving so serious that it was necessary to land him at the first calling station. The boat, it will be remembered, subsequently sank in St. Simon's Bay, and all hands on board were lost.

Upon recovery from his illness, the Doctor resigned his commission, and commenced a private practice in the City of London. From the first he took an active interest in the local affairs of the one square mile, serving an apprenticeship first of all in connection with parochial life, and afterwards being elected as one of the representatives of the ward of Cordwainer in the Court of Common Council.

The year 1874 brought the Doctor's career as a Corporator to a close. Dr. Letheby, who had succeeded Sir John Simon—who may be looked upon as the pioneer of the developments in the direction of sanitary science that have been witnessed during the past century—resigned the position of Medical Officer of Health and Public Analyst after a lengthy service. Dr. Sedgwick Saunders became a candidate for the position. Some little controversy arose as to whether he could retire from the Court, and be elected to the post he sought. Legal opinion was obtained, and, on the authority of the Recorder, the candidature of the Doctor was allowed to stand. The appointment was subsequently made at the meeting of the Commissioners of Sewers. Immediately afterwards the appointment of Food Analyst was made, four candidates presenting themselves, and the Doctor obtaining the appointment by a majority of 34 over Dr. Tidy, who was supported by 15 votes. From that time until the breakdown of his health last year the Doctor was not only one of the ablest, but one of the most loyal officers connected with the Corporation. "To him," says the *City Press*, "we owe in a great measure the improvement that has taken place in the sanitary condition of the City in the past quarter of a century, while to the energy he displayed in training the members of his staff, and personally superintending their work, we are indebted for the immunity from disease and the low death-rate that have been characteristic of the City for a long while past." Apart from the annual report he presented—which in itself was a masterly review of the work of the year, and an outspoken retrospect of events of importance from a sanitary point of view—the Doctor had published many notable works on medical topics, several being to this day regarded as classics in the profession.

By his death the City loses one of its most distinguished officers, the medical profession a man of mark, and his large circle of friends an associate whose memory will long be held in affectionate regard.

National Health Society.

OFFICIAL TRANSACTIONS.

Training Course for the Certificate of the Sanitary Inspector's Examination Board.—Attention is specially drawn to the fact that Training Lectures in preparation for this examination commence next week, on Tuesday, the 29th inst., and intending students should loose no time in communicating with the Secretary, 53, Berners-street. Lectures on "Nursing" begin on January 24th, and a course on "First Aid" on January 28th. Details of these syllabuses will appear next week in this column.

An interesting paper, entitled, "Is the High Infantile Death-rate Due to the Occupation of Married Women?" appears in the January number of the *Englishwoman's Review*, by Mrs. Greenwood.

ASSOCIATION OF NATIONAL HEALTH WORKERS.

The second "At Home" of the Association of National Health Workers will be on the last Saturday in January, the 26th inst., at 3 p.m., at 53, Berners-street. Mr. Westaway has been asked to preside.

Messrs. Campion and Jeune, the examiners of Private Bills, sat in Committee Rooms 16 and 17 of the House of Commons, to receive proof of compliance with the Standing Orders of Parliament in respect of the measures deposited for consideration in the ensuing session. There was no opposition in the case of the Brighton Corporation Bill, the City of London (Spitalfields Market) Bill, the City and South London Railway Bill, and the Islington and Euston Railway Bill, and, the formal proofs required by the Standing Orders having been given, the examiners declared that the regulations had been duly complied with. The measures will accordingly be reported for first reading. In the case of the Kingston-upon-Thames Corporation Bill, the measure was marked in the examiners' list as "dead." The reason for this is that the burgesses of the borough have recently been polled on the matter, and have rejected by a large majority the Corporation's proposal to construct municipal tramways for the district.

NOTICES.

ANNUAL SUBSCRIPTIONS.—The Annual Subscription to "THE SANITARY RECORD," for the United Kingdom, paid in advance, is 12s. 6d. For the Colonies and Abroad, 15s This includes postage, and a Copy of the Diary, post free.

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The Sanitary Record
AND
Journal of Sanitary and Municipal Engineering.

JANUARY 24, 1901.

"THE QUEEN IS DEAD."

NOTHING within the memory of living man has sent such a thrill through the wide world as the news which flashed along the telegraph wires on Tuesday last:—"The Queen is dead." So the word was passed from man to man, and none but realised that a great and terrible blow had befallen our Empire. Under the shadow of so great a sorrow it is impossible to write as we may be able to in future days, for our noble Queen has been so inseparably linked with our national life for so long a period that we cannot realise that she has passed away and is no more.

Who can ever measure what her wise and beneficent rule has been to the British Empire? Under her the English-speaking race has taken foremost rank in the nationalities of the world. And this not so much by the triumph of arms, as by the loftier ideals given to its life by the noble example of its Monarch. From the very outset of the Queen's occupancy of the throne she has done all in her power to encourage the arts of peace. Everything that would better the condition of her subjects, any plan for the alleviation of suffering or combating disease, found in her a sympathetic friend. As she spared not herself in the service of her people, so she also taught her children that their duty was to be found in works of love and service to the nation. Hence, since the time when the great sorrow came to her forty years ago in the loss of the Prince Consort, her work has been largely delegated to them, but we may be sure that she never faltered in the interest so early manifested in the social regeneration of her people. Whilst continental monarchs and their families often confine their public acts to mere military display, the members of our Royal household have ever taken the greatest delight in showing approval of works of usefulness and improvement, and in going quietly in and out among the people, to show that they sympathised with them in all attempts after happier conditions of life and service. It was this *sympathy* which bound the Queen to the people, and which was never more shown than when she came to London last spring, or in her visit to the Emerald Isle but a few months since. The plaudits then given were not the begrudged applause to a despot, but the heart echoes which ever respond to the sympathetic advances of a true and devoted friend.

As a nation we mourn the loss of our beloved Queen, but we shall ever glory in her life. It marks the emancipation of the people from political serfdom; it marks the greatest advances ever made in science, mechanics, and social reform; it marks the purification of the life of the Court, with its reflex effect upon the life of the nation; it marks the breaking down of class barriers of former days, and in many ways the advent of a practical exemplification of the brotherhood of man. For the sixty-three years of her reign, Victoria the Good strove to promote these objects, and right well did she succeed. Full of years and honours, she has passed away, but her influence will remain, and the good works she inaugurated, or saw commenced, will bear abundant fruit in the ages yet to come.

Housing at Birkenhead.

There was some straight talking at the inquiry held last week by Mr. R. H. Bicknell, on behalf of the Local Government Board, into the application of the Birkenhead Town Council for a loan to build under the Housing of the Working Classes Act, 1890. It would appear that the people to be provided for are among the very poorest in the district, and while the Council is prepared to build good sanitary houses, there is a strong feeling against building "palaces," for such was the description applied to the places prescribed by the bye-laws of the Local Government Board. That the property to be displaced was insanitary there could not be two opinions. The Medical Officer of Health pointed out that the average death-rate in the whole area embraced in the scheme was 55·8 per 1000 against 18·9 for the whole borough. Following up this evidence, and that of the Engineer and the Chief Inspector of Nuisances, came the ultimatum from the Town Clerk on the point we have mentioned. At a former inquiry the Local Government Board had insisted on the Corporation building houses at a cost of £400 each, which it was impossible to let at 5s. or 6s. per week. If the same restrictions were again to be imposed, "the Corporation would not do anything except under compulsion." The Town Clerk said he wished to emphasise this view, and believed the whole country was with them. He was quite "sure the Act would be better carried out and better understood if the Board would not insist upon houses being built altogether unsuitable for the class of tenants displaced." Of course, the Inspector could only undertake to present this view to the Board, and we hope it will receive very careful attention. It is little short of madness to take certain people from the slums and place them in dwellings with "every modern improvement." They are not capable of bearing such a change. First teach them cleanliness by putting them in places with the minimum of material capable of destruction. They must be watched like children, and compelled to comply with the elementary laws of health. When they do this, and have learnt the benefits of healthy surroundings by experience, then, and only then, they may be fitted for the better class of house.

A Neglected Health Resort.

At this season of the year many Britishers hurry off to the Continent to seek refuge from the fogs and variations of climate. Sometimes they succeed, but not always. And, after all, is the Continent, with its round of gaities and gambling saloons, the best place to seek recuperation? This question is asked by Dr. J. Oldershaw, in a letter to one of the Liverpool papers, in which he directs attention to one of our possessions, as providing a health resort quite equal to those regarded as fashionable, without their attendant evils. There is no model climate, he asserts, no country can boast of being perfect; change from one climate to another is one of the means by which invalids may regain health, and that which possesses the greatest advantages and the fewest drawbacks is to be commended. To the man of leisure in search of a mild dry climate with a moderate temperature Jamaica should be recommended. It involves only a short sea passage of twelve days in a well-appointed mail steamer, with a fair weather voyage, for at this time of the year every hour from England to the south-west brings you nearer to the soft breezes and blue sea of the Ladies' Gulf. "Kingstown," Dr. Oldershaw goes on to say, "the capital of the island of Jamaica, is a healthy city, of some 55,000 inhabitants. The soil is of a gravel bed, with a slope to the sea of 1 in 85. There is no malaria, and Kingstown is one of the healthiest seaport towns in the West Indies. A trip by the Imperial Direct West Indian Mail Service from Bristol provides at once one of the most beneficial changes of climate. A short sojourn in the island cannot but be of the greatest interest to the traveller, merchant, or brain-fagged professional, while the railway, tramcars, and well-appointed hotels assure the invalid of every home comfort, intensified by the boundless hospitality of the West Indian. To the sufferer from asthma, bronchitis, gout, rheumatism, or atonia dyspepsia, no better route could be recommended, while the botanist, horticulturist, and political economist will find in the island a wealth of natural enjoyment undreamed of. The ordinary tourist, surfeited with the joys of European spas or Norwegian fiords, will find a perfect change in the glorious scenery of this beautiful land of mountain and river."

Inoculation with Infected Serum.

According to the correspondent of the *Morning Post* at Rome, a serious scare has been caused in Italy by the death from lockjaw of a number of persons who had been inoculated with anti-diphtheria serum prepared by the Milan Serum Institute. About a month ago more than three hundred tubes of new serum were distributed to doctors and chemists in various parts of Italy, but nothing happened to cast suspicion on the purity of the serum until a number of persons who had been inoculated for diphtheria at Valdobbiadene died of lockjaw. While inquiry was being made into the causes of these deaths other cases of lockjaw following on inoculation for diphtheria were reported from other parts of Italy. It was then found that the serum used for all these inoculations belonged to the batch of three hundred tubes despatched from Milan about a month ago. Urgent telegrams were at once sent to all purchasers of those particular tubes, and two hundred and thirty of them have now been sent back to the Milan Institute. A dozen more have been traced, but the rest are either used up or untraceable. In explanation of this unhappy incident, the theory put forward is that tetanus microbes, which abound on the skin of horses and in stables, fell into the vessel used to catch the blood of horses

from which the serum was made. The greatest precautions had been taken to prevent the presence of diphtheria bacilli in the receptacle, but it does not seem that the same precautions were used with regard to tetanus. Yet if this is the real explanation it is strange that a case of lockjaw arising from use of the serum has never before occurred, since the Milan Institute has distributed quantities of anti-diphtheria serum in the past made in precisely the same manner. Last year the serum proved efficacious in checking an epidemic of diphtheria in the Venetian Provinces. The medical world and the general public are awaiting with intense interest the report of the expert commission of inquiry which has been appointed to examine the infected serum. The occurrence, however, is greatly to be deplored. Nothing is more calculated to shake public confidence in new discoveries than want of proper care in their preparation. And, further, people are hardly likely to accept as a remedy for one disease that which may contain elements of another, and that a more surely fatal one.

The L.C.C. Housing Managership.

Much interest surrounds the appointment of the head of the new housing department of the London County Council. The position, as we indicated at the time when it was resolved to create it, is somewhat novel, and upon its success or otherwise will depend similar appointments by the larger cities and towns in the United Kingdom. Several names of likely men have been mentioned, but one of the most suitable that we have heard is that of Mr. Peter Fyfe, the present chief Sanitary Inspector of the City of Glasgow. His experience is quite unique, and since he was appointed to his present position some very practical work has been done in the way of improving the housing accommodation of the poor of Glasgow. Mr. Fyfe is well known to our readers, and some of his addresses and papers are among the most valued contributions on the social problems of our day. He is by no means a man of one idea, and should he be the successful candidate, there are many matters upon which his advice might well be sought by the governing body of the metropolitan county.

The Value of School Closing.

There can be little doubt that the first step necessary on the outbreak of any infectious disease is to place a most careful watch over the elementary schools. If this is done an epidemic may be prevented, or, at any rate, its ravages restricted. This has been done in Leicester, and what in December threatened to be a serious outbreak of diphtheria is nearly stamped out. In the second week of last month forty cases were notified, but with the closing of the schools the number has gradually decreased, until in the second week of January there were only fourteen. Of course it may be that the disease has spent itself, but the Sanitary Committee of the Borough has, we think, justified its action in insisting on the closing of the schools. All parents are not careful, and nothing is thought of keeping children at school long after they have developed symptoms of a serious character. It is this lack of care that makes the appointment of a Medical Officer for every school a necessity. Children displaying the slighest indication of "sore throat" should be at once suspended from school attendance; this would stop much zymotic disease. It is better that one child should lose a few days' schooling than for hundreds of lives to be jeopardised.

Plague and Small-pox in the Country.

The country is once more disquieted by the news that plague has made its appearance on our shores. The Local Government Board have notified its appearance at Hull on the 15th inst. The steamer Friary from Alexandria, after calling at Algiers, arrived at Hull on the 10th inst. The body of a seaman, who had died before the ship's arrival, was, after the usual inspection by the Port Medical Officer of Health, removed to the mortuary, but there was then no actual sickness on board. A couple of days later, however, two other members of the crew sickened, and two more a few days after. All four died, and though the cases had at first been diagnosed as influenza, with lung complications, a bacteriological examination of the viscera made by Dr. Klein established that the cause of death was pneumonic plague. Besides the fatal cases, four other seamen were taken to hospital and isolated. They are stated to be making good progress towards recovery. The Hull Authorities are fully on the alert, and are exercising every precaution. The bodies of two of the seamen were cremated in the new Municipal Crematorium. Dr. Mason, Medical Officer of the Hull and Goole Port Sanitary Authority, is confident that owing to the prompt isolation of the disease, little danger need be apprehended by the public. Small-pox is, however, raising its ugly head in more than one part of the country to a degree that is well fitted to excite apprehension. There are a number of cases at present in Bradford, and single cases have also appeared in several other towns in the West Riding of Yorkshire. There does not appear to be any visible connection between these cases, and with regard to the outbreak in Bradford, the Medical Officer is at a loss to account for its origin. It has been suggested that it may be traced to some soldiers who returned from South Africa last October, the Bradford Authorities having been notified at the time that small-pox had occurred on board the transport during the voyage; but the connection with the present outbreak has not been satisfactorily established. A much more serious outbreak is engaging the attention of the Authorities in Glasgow. Last week Dr. Chalmers, the Medical Officer, stated in his weekly return that no fewer than 78 cases had been admitted to the small-pox wards during the week, the total number then under treatment being 121, as compared with 66 the preceding Fri-

day. The cases had for the most part been confined to the east end of the city. From Glasgow it has spread northwards to Morayshire, cases having occurred in Elgin and in Burghead, which were distinctly traceable to the visit of a sailor from Glasgow to his relatives there, he himself having been seized with small-pox on his return south. In connection with the Glasgow outbreak Dr. Chalmers mentions that the most discouraging feature is the indifference of the public to mild forms of the disease, which seriously handicaps the efforts of the Sanitary Authority. An offer by the Corporation of free vaccination had met with a most disappointing response, only nineteen persons having taken advantage of the offer. In such cases, unless the public are willing to co-operate with the Sanitary Authorities, the efforts of the latter must be deprived of much of their efficiency.

L.C.C. Rival Policies.

In view of the approaching election for the London County Council on March 2nd, a lengthy manifesto has been issued by the Conservative section of the Council, in which not only is their opponents' policy fully criticised, but their own policy is set forth in detail. Unfortunately the County Council has acquired a political complexion which it will not be easy to get rid of—if, indeed, there is any honest desire on the part of members to purge the Council of it. The Moderates in their manifesto attribute this political character entirely to the action of their rivals, and claim that "Business, not politics," is to be their watchword. The value of such a claim cannot be judged of until we have had an opportunity of seeing how the Moderates would act if they were returned with a majority. But it must at least be admitted that in some parts of their programme they proclaim a sound and much needed policy. They propose to devote particular attention to the Housing of the Working Classes—a feature of the Council's work in regard to which they have a heavy indictment for the results of the policy of the past few years—deriving wisdom, no doubt, from the experience. If they can work up the practice of the Council to the ideal they set before them, a new era in the development of the housing problem is in store for us; one in which those dispossessed by clearance schemes will first be accommodated elsewhere, and so far as possible in the neighbourhood of their occupations; in which such economy in building and in management will be observed that the rents of the new houses will be brought within reach of the poorest classes, the classes, in other words, who are the subjects of the improvements and who are dispossessed; in which building schemes will involve no charge on the rates, and co-operation with other bodies having similar aims will be sought. In other departments of the programme, such as the subject of the London water supply, there is considerable vagueness, the responsibility for action in the case we have instanced being practically delegated to the Imperial Government. It would be well if the electors would in this most important coming election adopt the advice inculcated by Lord Rosebery with so much force in connection with the Borough Council Elections, to eschew party politics altogether, and to see that none but the best men, independent of their politics, are elected to the Council Board.

The Growth of Cremation.

The report of the Scottish Burial Reform and Cremation Society, Limited, which has just been issued, besides giving a *résumé* of the operations of the society for the past twelve months, contains some instructive particulars regarding the progress of modern cremation during the last quarter of a century. The progress made, during recent years especially, has been very striking. The subject was first raised by Sir Henry Thompson in 1874; but for ten years the Government declined to sanction any cremations. In 1884 cremation was announced to be not illegal, and in 1885 was commenced in England, but still did not obtain Government sanction. Now, in 1901, not only has all Government opposition disappeared, but an Act has been passed granting to Local Authorities in England power to expend public money in erecting crematoria. The society is taking steps to have the operation of this Act extended to Scotland. The opening of the first municipal crematorium at Hull is but the commencement of a new chapter in municipal activity, and one the value of which it is impossible to over-estimate. The example of Hull is a fitting inauguration of the new century, and it is a safe prediction that the close of the century will see a complete and radical change in our burial customs, much to the advantage of the public health. Indeed, so rapid has the growth of enlightened public sentiment been on this question, that the next ten years may be expected to witness a very great reform. The report points out that many cases have been known to occur where persons who during life favoured the idea of cremation, and expressed a desire to be cremated on death, have been buried in the ordinary way; this disregard of the wishes of the deceased having been exemplified recently in the cases of two very prominent Scottish noblemen. To obviate this as far as possible it is recommended that the form of request issued by the society be signed in duplicate. Reference is also made to the fact that, during the recent outbreak of plague in Glasgow, the bodies of those who died of plague were not cremated, notwithstanding the express desire of the Health Authority—mainly owing, it is believed, to the opposition of the Roman Catholic clergy.

A Local Government Board inquiry has been held at Wakefield as to the proposal of the Corporation to purchase and close fifteen houses in different parts of the city, and to erect artisans' dwellings on a piece of land near the sewage and electric works. The property to be acquired is for street improvements in Drury-lane, Marygate, and Warrengate.

MUNICIPAL ENGINEERING & SURVEYING.

CROSS-TABLE CHAT.

It is be observed, with a sense of disappointment, that the scheme, originated nearly two years ago, for establishing an Orphan Fund under the *ægis* of the Incorporated Association of Municipal and County Engineers, hangs fire badly. Seeing that its purpose for providing means whereby board and education for the children of municipal engineers who have died and left them unprovided for is essentially a benevolent and brotherly one, it is the more to be regretted that a fraternal interest is not taken in it. The hon. secretary and treasurer—Mr. O. Claude Robson, late president of the association, and Engineer to the Urban District Council, Willesden—has within the past fortnight issued a circular to the members appealing for better support, and I earnestly recommend its claims to my readers.

It is not creditable that out of a membership of 950 only 66 members of the association figure as donors or subscribers, and that the total amount subscribed—which includes 100 guineas from Mr. "Johnny" Parker, of Nottingham, and three other donations of ten guineas each which do not come from members of the association—only amounts to £315. The claims of the children who are left fatherless should evoke more goodness of heart than is displayed by the list of subscribers which Mr. Robson has issued, and it is not suggesting too much to say that every member of the association can and should afford not less than 5s. per annum to the fund. If this small amount were forthcoming generally it would mean a yearly addition of £220 per annum to the fund and would enable the trustees to minister to the appeals for assistance which are made to them.

The annual volume of "Proceedings" of the Incorporated Association of Municipal and County Engineers for the year 1899-1900 has just been published. Its appearance is somewhat belated, seeing that the year ended in July last, but this I am told is characteristic of the comatose condition of the association—or more probably the Council elected by it. The volume is the smallest in bulk which has been issued for a considerable number of years, only four meetings being held during the twelve months covered by it—a truly disappointing record. The various papers read by the members are, as usual, of great value and interest, and it is to the loss of the association generally that there are not more of them. It has been suggested to me that the balance-sheet of the receipts and expenditure deserves the careful scrutiny of members, as starting with a balance of £209, this was reduced, owing to financial mismanagement, down to £87, notwithstanding that the receipts amounted to over £1000. Out of this amount the sum of nearly £440 has been spent in printing—a sum which I am assured is unreasonable and excessive. If the association is ever to become a power it is essential that it should husband its resources and establish a fund which will enable it to have its own offices and establish a library in a permanent and creditable form. On the present policy the small reserve fund of the association is in danger of being entirely whittled away.

One of the most sensibly-written *brochures* on the cause of smoky chimneys which I remember to have seen is that which has just been issued by the widely-known firm of Messrs. Joseph Place and Sons, Limited, Darwen, Lancs, entitled "Smoky Chimneys: Some Hints as to their Cause and Cure," at the nominal price of 1d. The little book is not prepared for the sole purpose of "puffing" any patent chimney cure, but gives in a concise form the "boiled down" experiences of upwards of twenty years' study and experiment, and is worth the very careful perusal of every municipal engineer and architect, who will find in it much that he can profit by.

I predicted a month ago in this column a general fall in the price of iron and building materials. That the inflated prices which have been ruling for the past two years could be long maintained was impossible, and when I last wrote to warn my readers to avoid entering into long contracts, I did so with a knowledge which was not general. That my prediction was absolutely correct is confirmed by the recent great reduction in the price of iron and coal. At the last quarterly meeting of the Midland iron trade the price of Staffordshire bar iron fell to £7 10s., or nearly £3 lower than at the previous meeting, whilst coal for manufacturing purposes has recently dropped 3s. per ton. Inasmuch as the price of all building material is regulated by the prices of coal and iron, it will be seen that the market is well on the down grade.

There is still another competitor against the electric light for public and private installations to be recorded. This is the Kitson system of incandescent lighting by pretroleum, whose offices are at 1, Victoria Embankment, Blackfriars, London, E.C. This system originated in America, and is now considerably used in New York, Philadelphia, Boston, Baltimore, &c. The company allege that their system has in numerous instances displaced the electric light and high-pressure gas burners, and claim that it is "not only the most brilliant, but the cheapest light that has ever been produced." Each lamp carries its own oil and vaporises it, thus converting it into oil-gas, which is burned in a refractory mantle, it is stated, "in sun-like incandescence." The oil used is specially prepared and refined, and termed "Kitson Incandescent Oil." The system has been adopted on a number of railways, manufacturers' premises, and for street lighting in various towns in England. Whether all that is claimed for it can be substantiated I am as yet unable to determine, but some of my readers may find it deserving of a trial.

Senex.

REVIEWS.

Arsenical Poisoning in Beer Drinkers. By T. N. Kelynack, M.D., and William Kirkby, F.L.S. Demy 8vo., 137 pages and 16 illustrations. London: Ballière, Tindall, and Cox. 1901. 3s. 6d. net.

The authors are to be congratulated on the rapidity with which they have produced this opportune book. That it should show no more evidence of haste is surprising and creditable. The earliest cases of this epidemic have been traced to the spring of 1900, but it is probable that arsenical beer has been in use for a much longer period. In fact, the outbreak has led to a reconsideration of the question of the long-known "alcoholic neuritis," and to a suggestion that this disease may, in former times, have been due to, or at least intensified by, the unsuspected presence of arsenic (page 77), which many authors have shown to be one of the most widely distributed of substances. In the first or medical section of this volume (page 58), the differences are summarised between so-called "alcoholic" neuritis and the recent cases in the North. The chief of these are (1) that the latter have not been confined to *excessive* drinkers, but have exclusively attacked consumers of beer; (2) the acute onset and rapid development, and in many cases the immediate improvement when the beer was withdrawn; (3) the general absence of certain symptoms, notably tremor and diges-

tive troubles, which are common in the alcoholic form, and the presence of special well-marked signs, such as extreme sensitiveness of the skin, "pins and needles," erythema, pigmentation, and "erythromelalgia" (erythema with pain, especially in the soles and borders of the feet), wasting, paralysis, dropping of feet and hands, anæmia, watering of the eyes; the affections being mostly symmetrical. At the same time there can be no doubt that the "alcoholic" influence has greatly accentuated the toxic action of the arsenic, and that improvement was most manifest when all kinds of alcohol were withdrawn. The author quotes the words of Dr. Judson Bury,* "The scare with regard to poisoning by arsenic has been fully justified, but surely consternation regarding poisoning by alcohol might be looked on as equally natural."

Both sexes and all ages were attacked; even infants receiving the poison from the breast, though arsenic was not detected in the milk. Among the interesting cases detailed is that of "a bonny little girl of two years" (page 50), who suffered severely; "the child's father keeps a public-house, and although so young, she was accustomed to get little 'sups' of beer" found to contain arsenic "from the customers."

The remarkable features of the epidemic are (1) that although the beer had been for some time under suspicion, the symptoms simulated so many other diseases, and assumed such a variety of types (pages 53, 61), that it was not till the end of November, 1900, that Dr. Reynolds first indicated arsenic as the cause,† followed by the chemical discovery by Kirkby a little later;‡ (2) the minute fraction of poison detected, and the small quantity of drink that was stated to have been taken in some cases, often computed to have contributed only a medicinal dose of arsenic in a week; (3) the fact that this drug had frequently been given for the very diseases that were here occasioned (page 75) with regard to (2), arsenic is known to be cumulative, and a proof was found in the fact that although traces were found in the urine, they generally disappeared when the beer was stopped, showing that the poison was not being wholly eliminated, and, secondly, that in fatal cases arsenic was present in the liver and other organs. It is also certain that the amount of liquor consumed is very rarely correctly stated.

As to the gravity of the outbreak, at least 2000 severe cases, with many minor illnesses, have occurred in the Manchester district, 66 deaths in Salford during four months attributed to the disease, 143 cases at Liverpool Infirmary, 200 or 300 at Heywood, with scattered examples in thirty-five towns, including Birmingham, Chester, Leamington, Penrith, and London, besides rural districts (page 4). Many of the cases will probably never recover (page 66). It is urged that all beverages should be subjected to chemical investigation (page 78).

A brief sketch of the treatment of the disease is given (page 71). The style of the first section requires much revision. Such words, repeatedly used, as "arsenicated," "trophic," "atrophic," "intoxication," "bed-fast," would be better replaced by "arsenical," "nutritional," "wasting," "poisoning" (in this sense), "bed-ridden" or "confined to bed;" while in "incoordination" the hyphen should be omitted. On page 45 it is said that patients "could only phonate with difficulty," meaning apparently "utter sounds." The word is not in Webster or Nuttall. The illustrations are certainly ghastly and sensational; many of them are but repetitions of one another, while the printing is not sufficiently good for the pigmentation and other details to be distinct. The second or chemical section gives the tests, results with beers and materials, a discussion of the source, a note on the excretion of the poison, and the dosage, concluding by proposing (1) "the adoption of a standard test for arsenic to which all samples of beer must conform;" (2) a regulation to be promulgated that no sulphuric acid (or hydrochloric) shall be allowed to enter into the composition of any food or drink unless it is found to be arsenic free, as tested by a standard test.

A good bibliography is appended. The book is of sanitary value, but seems designed to penetrate to the public eye. A remark on page 57 is significant:—"A patient who had attended for some time at an eye hospital, finally diagnosed her own condition (arsenical) from reading of the epidemic in the daily papers."

* *British Medical Journal*, 1900, December 8th, 1629.
† *Ibid.*, November 24th, 1900.
‡ *Medical Press and Circular*, November 28th, page 1900.

The Oil Chemists' Hand-book. By Erastus Hopkins, A.M., B.Sc. Published by Chapman and Hall, Limited.

This hand-book consists chiefly of elaborate and carefully-prepared tables of the general properties, adulterations, solubilities, physical and chemical constants, &c., of the oils and fats. These, we are told, are not the mere compilation of other workers' results, but are the figures obtained by the author in his own laboratory, and this claim is well borne out on examination of the different tables. Of course, such names as Allen, Wright, Archbutt, Hübl Lewkowitsch, and other notable workers in the chemistry of fats and oils are often quoted. The data given under the author's name show that they are the results of one who must have had considerable experience in the testing of oils. The tables of the general properties and adulterations of fats and oils are good and complete, and those of the physical and chemical constants have been recorded in a very thorough and exhaustive manner. The book contains valuable instructions in the preparation of solutions, &c.; for instance, on page 33 it gives the best means of preparing a colourless alcoholic volumetric solution of K H O, and of obtaining pumice stone that prevents violent ebullition on page 36. One is surprised that no account is given of the Valenta test, which is often of great value in the examination of butter fat, inasmuch as the range of the turbidity temperature is very wide and is an excellent means of judging whether margarine is present or not. The great variations between the Valenta figures recorded by different observers on page 14 is probably due, not so much to the natural difference in the samples used, but to the slight variation of the strength of acid. It is not possible to be too exact in setting the acid, and in the experience of many analysts the temperatures of turbidity given by different samples of the same oils do not vary so much as one would conclude from the table given. The work will be found a valuable book of reference to those who are engaged in the examination of oils. The theories of the processes enumerated are well explained, and the binding and type are worthy of the work and a credit to the publishers.

The seal of the Yeovil Town Council has been affixed to a draft of mortgage to the Public Works Loan Commissioners for £11,233 in connection with works of sewage disposal, and it was decided to issue tenders for the works, which, however, will cost a sum considerably in excess of that now authorised to be borrowed. The system adopted is that known as the septic treatment. In regard to two districts outside the borough area which are now connected with the Yeovil sewers and which the Rural District Council objected to being made a special drainage district, as desired by the Town Council, Judge Philbrick, Q.C., to whom the matter was referred, as arbitrator, has decided that the Rural Authority is equitably and morally bound to consent to the proposal.

Public Works.

SEWERAGE.

The Erdington District Council has resovled to construct a brick sewer in conjunction with the Bleak Hill sewer. The cost, with contingencies, will come to about £7000.

The Swanage District Council, on the recommendation of the Works Committee, has resolved to apply to the Local Government Board for leave to borrow £1160 to secure the outfall sewer.

The Camborne Surveyor estimates that the drainage schemes of Beacon, Pengegon, Wheel Gerry, &c., will cost a little over £2000. Application has been made for sanction to a loan of £2500 for these works.

Mr. J. E. Wilcox, C.E., attended a recent meeting of the Pershore District Council and explained a scheme for dealing with the sewage of Cropthorn at a cost of £1132. The proposal was referred to a committee.

At the last quarterly meeting of the Thame and Rea Drainage Board the report of the Works Committee was adopted, and the estimate of £29,821 for the drainage of four hundred acres of land, tendered by Messrs. Walker and Co., was accepted.

The Liverpool City Engineer has prepared an outline scheme for a refuse destructor on a site in Wellington-road, and this has been approved by the Health Committee, and the Engineer directed to prepare and submit detail plans and specification of the necessary work.

At the last meeting of the Newark Rural Council a letter was read from Mr. Herbert Walker, C.E., enclosing an amended scheme for the drainage of Balderton. The estimate was for £12,000, as against £10,800 for the last scheme. It was approved, and ordered to be sent to the Local Government Board for its sanction.

A specially summoned meeting of the Selby Urban District Council was held at the Town Hall, Selby, last week, for the purpose of considering what action should be taken in regard to the proposal of the Leeds Corporation to construct a sewage farm at Gateforth. There was a large attendance of members, and the decisions arrived at were unanimous. It was resolved that the Selby Urban District Council should oppose the Bill being promoted in the present session of Parliament by the Leeds Corporation.

Last week Mr. A. C. Atkinson submitted and explained to a special meeting of the Formby Parochial Committee his amended and reduced scheme for the drainage of Formby. The scheme of Mr. Atkinson, which was adopted by the Parochial Committee a few months ago, was, including all charges, estimated to cost just on £55,000, but officials of the Local Government Board pointed out that the scheme as it stood was impracticable, in so far as its cost far exceeded the borrowing powers of Formby, and it was subsequently decided by the Committee to ask Mr. Atkinson to bring his scheme within the cost of £38,000. This Mr. Atkinson intimated his willingness and ability to do, and last night he presented his scheme so amended. His estimate of the total cost of the altered scheme, including way leaves, surface-water drainage, internal drainage of private and public roads, outfall sewers, and purification works, was £37,350, and including engineer's charges and a clerk of works' salary, £39,914. Mr. Atkinson pointed out that there was only a slight diminution of the area to be drained, the chief saving being in doing without the filter beds provided by his previous scheme. It was resolved to submit the amended scheme to Mr. Wood, of Liverpool, for his expert opinion.

With reference to the Ossett sewerage scheme, the scheme of extension at the Healey outfall is now approaching its last stage. It was sanctioned by the Local Government Board without any alteration or suggestions. Possession of the land has been got, and the Corporation has instructed Messrs. Malcolm Paterson and Sam Shaw, MM. Inst. C.E., who are joint engineers, to prepare for letting the contracts. The works consist of three miles of intercepting sewers, new tanks, buildings, machinery, storm-water filter, and land filtration beds, and the Engineer's estimate, inclusive of land, is about £10,000. It is expected that the works will be let before the middle of March.

A Local Government Board inquiry has been held at Harbledown with reference to an application by the Bridge Rural District Council for sanction to borrow £5000 for the purposes of sewerage and sewage disposal for the parishes of Harbledown and St. Nicholas Hospital. Mr. Bromley, Consulting Engineer, explained the scheme. The total population of the two parishes was 868, and the total estimated quantity of sewage, taking sixteen gallons per head in any weather, would be 8000 gallons every twenty-four hours. The sewage would be pumped by means of two gas engines into bacterial tanks, where it would be dealt with. The effluent would then pass through an open channel and the subsoil in 3in. field pipes, whence it would be conveyed into the river. One pair of tanks would be provided with automatic syphons, so that they could be dealt with without an attendant. In times of storm provision was made to deal with three times the usual amount of water, while by filling the bacterial beds three times a day a double volume of sewage could be treated. Mr. Thudichum, of Messrs. Dibdin and Thudichum, consulting chemists, Westminster, called by Mr. Collard, explained some technical details of the scheme.

At a recent meeting of the Barrow Rural District Council a communication was received from Messrs. G. and F. W. Hodson, the firm employed as engineers for the Woodhouse sewerage scheme, enclosing the original plans of the scheme with drawings of additional bacteria beds, a new storm-water filter bed, and the new manholes which it had been suggested should be placed in the line of sewers. The letter stated that the filter beds as now proposed would be more than ample to deal satisfactorily with the sewage of an agricultural village such as Woodhouse. Moreover, with the view of allowing an ample margin for the dry-weather flow of sewage, they had estimated the flow at 20 gallons per head, as it had been ascertained that the Local Government Board requirements provided all that was necessary in respect of a possible increase of population. The additional cost of the scheme as amended would raise the total estimate to £7000, and it would be necessary for the Council to pass a resolution asking for sanction to borrow that amount. The Council should also give an undertaking that in the event of its being unable to renew the lease at the expiration of the twenty-one years, it would take steps to purchase the land occupied by the sewage farm, either by agreement or under the compulsory provisions of the Public Health Act. It was decided to transmit the plans to the Local Government Board, and to ask for sanction to borrow £7000.

WATER.

The Elham Rural District Council proposes carrying out a scheme for the water supply of Lyminge.

A new water tank, one of the largest in England, recently erected at Trimley for the Felixstowe Water Company, burst last week while undergoing a pressure trial. The tank was nearly full at the time, and held about 95,000 gallons (400 tons) of water.

The Dover municipal water supply yielded a profit of £4337 last year, equal to a sixpenny rate. The water supplied to the houses of £20 rating at 10s. a year, and in proportion.

The Town Clerk of Hartlepool (Mr. Bell) reported to a special meeting of the Town Council recently that the Tees Valley Water Board were, in their Parliamentary Bill of which they had given notice, asking for certain powers, the object of which was to enable them to supply any company within the boroughs without asking the consent of the Corporation. Without discussion it was agreed to approach West Hartlepool Town Council with a view to opposing the grant of any such power.

At the last monthly meeting of the Ruthin Rural Council, the clerk, Mr. R. H. Roberts, submitted the terms of the North Wales Asylum Authorities for supplying the village of Nantglyn with water from their mains. These terms were that the quantity drawn should not exceed 3000 gallons per day; that the distribution of the water shall be in the hands of the District Council; and that the rent shall be 1s. per 1000 gallons per annum. It was decided to refer the matter to a committee with a view of carrying out the scheme.

A scheme was laid before the Flamborough Parish Council last week by Mr. Eric Smith, sanitary engineer, Bridlington, for providing a better water supply for the village. The estimated cost was £3300, and though the Council was unanimously of opinion that the scheme was what was required, they considered that it would burden the ratepayers too heavily. The present rates are 4s. 6d. in the £1 per annum, and it was estimated that the scheme would bring them up to nearly 7s. in the £1. Mr. Smith was recommended to take his plans before the Bridlington Rural District Council.

The proposal to provide a new source of water supply for the borough of Basingstoke was advanced a stage at the last monthly meeting of the Town Council. The estimated cost of the suggested scheme is £16,819, and in drawing up the scheme Mr. Fitton has allowed for the possible requirements of the borough during the next twenty years. An ample and efficient water supply is one of the first requirements of a community, and it is well that the Council, before finally adopting a scheme —especially one involving such a large expenditure— should be fully assured on all points. The inhabitants of the borough will be reassured to know that the matter of a new supply has now been definitely taken up.

The Bill dealing with the future water supply of Ilkeston and Heanor has been duly lodged in accordance with the Standing Orders for introduction into Parliament next session. The preamble recites that the supply of water from the existing waterworks of the Corporation of Ilkeston and the District Council of Heanor is inadequate to meet the growing demands of the inhabitants, and it is expedient that the water in the Meerbrook Sough should be utilised, and that, for that purpose, a Board should be constituted and incorporated representing the Corporation and the District Council, with power to acquire the undertaking of the Meerbrook Sough Company, and that other additional waterworks should be authorised. The cost of constructing the proposed works, exclusive of the Ilkeston and Codnor Reservoirs, is estimated to cost the Board £106,500. By Clause 46 of the Bill, the Board is to deliver into the Ilkeston Reservoir the quantity of water to which the Corporation will be entitled, and into the Codnor Reservoir the water to which the District Council will be entitled. These reservoirs are respectively to be paid for by the Corporation and by the District Board, and, subject to this, the Water Board ask for powers to borrow £112,500 and "such sum as may be requisite" for passing this Bill through Parliament.

At the last meeting of the Langport District Council a resolution to obtain a temporary loan of £1500 for works at Curry Rivel and Drayton in connection with water supply was agreed to.

On Tuesday of this week, at the Hackney Town Hall, the Mayor presided at a town's meeting, called at the request of the Borough Council, the Hackney Tradesmen's Association, and other local bodies, to support the action of the London County Council Committee in opposing the Bill now being introduced into Parliament by the East London Water Company.

The Easingwold District Waterworks scheme has received the assent of the Local Government Board. It is for the supply of eleven villages to the Easingwold union, and includes spring collecting works and covered storage reservoir at the foot of the Hambleton Hills and some 29 miles of distributing mains. The Council has instructed its engineers, Messrs. Fairbank and Son, C.E., of York, to at once get out the necessary drawings &c., for the letting of the work.

The Burgess Hill Water Company are about to promote a Bill in Parliament authorising them to construct additional waterworks, to acquire land, and to raise further monies; and a meeting of the owners and ratepayers of Burgess Hill was held last week to consider whether consent should be given to the Urban District Council opposing the Bill. The Chairman, in his opening remarks, explained that it was necessary for the Local Authority to convene a meeting of the ratepayers before they could take any action in opposing the Water Company's Bill in Parliament. The Burgess Hill Urban District Council were of opinion, and that opinion was unanimous, that, as a general principle, the supply of water should be in the hands of the representatives of the people, and not under the control of the Water Company. Therefore they insisted, as far as they were able, upon having a compulsory purchasing clause inserted in this Bill which the Water Company had now before the House of Commons. They thought that a Water Trust should be formed, which should consist of representatives of the areas at present served by the company, viz., Ditchling, Keymer, Clayton, Hurst, and Burgess Hill. The Chairman further pointed out that the Cuckfield Rural District Council was opposing the Bill, and it also wished to have a purchasing clause inserted for its own benefit.

The arbitration in respect of the acquisition of Mrs. Crofton's two reservoirs and water-rights on Burley Moor, near Ilkley, were concluded recently. The case is peculiar in its complications, and the methods of valuation adopted by the two parties illustrate two totally different principles. The claimant's engineers assumed that their client was in the position of a vendor of water, with power to sell in bulk to competing authorities, and assessed the claim, which included manorial rights, at £11,000. On the other hand, the Council's engineers contended that there was no power to sell or even divert the water, but merely to impound it, up to, and no further than, the present capacity of the reservoirs, which are encroachments on a common with rights gained by precipitation only, and to turn such water into the stream bed. They therefore assessed the compensation for the reservoirs and water-rights on the basis of the rental received and user at the claimant's mill, amounting to about £26 or £28 yearly, arriving at a total sum of £800 or £900 only. This, they maintained, was the true principal as laid down by the Lands Clauses Acts, namely, the value to the claimant at the time of transfer. They also denied the existence of competition, even if there were power to sell water. The umpire was Mr. T. T. Wainwright, of Liverpool, and the arbitrators, Messrs. T. Fenwick and Geo. H. Crowther. The claimant's case was led by Mr. H. Johnson, C.E., and the Council's case by their engineer, Mr. Malcolm Paterson, C.E.

The South Darley Urban District Council has approved and accepted a scheme of water supply prepared by Mr. Harry W. Taylor, A.M.I.C.E., of Newcastle-on-Tyne and Birmingham. The supply will be from springs issuing from the millstone grit measures, from whence it will gravitate to the whole of the district. The estimated cost is about £3500. Application to the Local Government Board for borrowing powers will be made at once.

LIGHTING.

The Local Government Board has sanctioned the borrowing by the Llandudno District Council of £240 for gasworks purposes.

The Elland-cum-Greetland Gas Company are promoting a Bill in the coming session of Parliament to extend the powers of the company, to amend the Acts relating to it, and for other purposes.

An arbitration began last week in the Windsor Hotel, Glasgow, with reference to the claim of £7457 9s. made by the Glasgow Iron and Steel Company as compensation for about seven acres of land which have been acquired by the Corporation to enable the North British Railway Company to lay sidings into the Provan gasworks.

Owing to the gas company and the Parish Council of Wainfleet, near Skegness (Lincolnshire) not being able to agree as to the price of gas for the street lamps, the town at night is in darkness. The Council offered to pay for the gas by meter, but the company hold out for 32s. per lamp. In the meantime, whilst the dispute is pending, the inhabitants have to grope their way about the town at night as best they can.

The Southwark Borough Council is proceeding with the cable extensions in the side streets, which had not been pressed forward in consequence of the delay in securing new generating plant. The laying of the cable through Doddington-grove down to the Kennington Theatre is in progress, and on the completion of this work cables will be laid in Elephant-road, Rodney-road, Elstead-street, Alvey-street, Westmoreland-road, East-street, and a portion of Beresford-street.

A special meeting of the Omagh ratepayers has been held for the purpose of consulting as to the steps to be taken to ensure the defeat of the Bill being promoted by the gas company for extended powers. The following resolution was passed:—"That this meeting of the ratepayers of the town of Omagh approve of the action of the Urban Council in opposing the Bill of the Omagh gas company, and we strongly recommend the Gas Company to withdraw the Bill, in order to save themselves and the ratepayers the heavy expense which a contest between them would entail."

The question of the electric lighting of Maidenhead is arousing considerable interest in the town just now. An adjourned meeting of ratepayers to consider the question was held last week. A resolution proposed by Mr. F. W. Porter at the last meeting, "That in the opinion of this meeting it is inadvisable to add £25,000 to the debt of this borough in order to introduce the electric light," was debated at much length, and an amendment was submitted, "That this meeting of ratepayers respectfully requests his Worship the Mayor to convey to the Town Council its entire approval of the action hitherto taken by them in regard to the electric lighting of the borough of Maidenhead." Very divergent views were expressed as to the financial results of lighting the town with electricity, and the experience of other towns was freely quoted on both sides. The result of the meeting was most unsatisfactory, as the Mayor declared both the resolution and the amendment to be lost, but it was the general opinion that the Mayor had made a mistake and that the amendment was carried.

The Sunderland Town Council contemplates a loan of £70,000 for the establishment of a second electric lighting station and the laying down of mains.

The Gas Light and Coke Company announce a dividend for the past half-year at the rate of £4 8s. per cent. per annum, carrying forward £221,570. At the corresponding period last year the dividend was at the rate of £4 18s. per cent., £193,335 being carried forward.

The examiners of the Houses of Parliament sat last Friday for the first time this year for the purpose of hearing the proofs of compliance with the preliminary Standing Orders in the case of private Bills which it is intended to introduce in the coming session. There was no opposition in regard to the Cleveland and Durham County Electric Power Bill, and the necessary formal proofs having been given, leave was given for the introduction of the measure in the usual course.

Two important events in connection with the electric lighting of Fulham took place last week when the British Insulated Wire Company tested the final batch of cables to be laid under the streets, and the General Electric Company made a test of the steam alternators and exciters at the general station. All the tests were highly satisfactory. A large section of the borough is now practically ready for the electric light to be turned on. The work is carried out by the Borough Council, and applications have been already received from private individuals, which are equivalent to over 10,000 eight candle-power lamps.

The opinion of a meeting of owners and ratepayers was taken by the Edmonton District Council last week on their proposal to join with four surrounding parishes in promoting a Bill in Parliament to establish generating stations and to provide electrical energy. It was urged against the scheme that it involved the district in too much risk, and that as a company had been granted the powers to supply electricity in bulk, the better course would be for the Council to obtain a Provisional Order to distribute it. The meeting, however, by a large majority, upheld the proposals of the Council. A poll was demanded. The scheme is expected to cost £400,000.

Edinburgh and Leith Gas Commissioners made an official inspection of the new works at Granton last week. They were shown over the buildings by Mr. Herring, the Engineer, who explained the progress which had been made since their last visit. The first retort-house, which is to be one of several, is now well on its way, and the Engineer explained that by June twelvemonth the Commissioners will be making gas there. The sooner the works are ready the better, as a sort of hand-to-mouth process is being carried on in connection with the Edinburgh and Leith works at present. There is only available just now storage for 6½ million cubic feet, while the consumpt per day is equal to 10 millions. When the first large tank, now almost completed at Granton, and likely to be ready in a month or two, is brought into operation, this will give storage capacity for another 6½ millions, which will be carried by pipe from New-street to Granton. Even then the storage capacity will only be two or three millions beyond the daily consumpt. The first retort-house, which is expected to be in working order in eighteen months, will produce another 10 million cubic feet per day, equal to the present total output. An interesting part of the works explained to the Commissioners was the method of bringing the coal to the retorts, the whole work being done mechanically and automatically, without any handling, after landing from the steamer. Lastly, the visitors were shown that portion of the works where it is intended to treat the residual products. This, it is expected, will be the source of a very considerable revenue to the Commission, and it is hoped that it will be open in a month.

The Leatherhead Gas and Lighting Company, Limited, which was formed in 1897 to acquire the undertaking of the Leatherhead Gas Company, has deposited a Bill for next session, under which statutory powers are sought to supply gas within the parishes of Leatherhead, Mickleham, Great Bookham, Little Bookham, Effingham, Headley, and Fetcham. The capital of the parliamentary company is proposed to be £40,000, of which £19,380 represents the existing capital of the limited company, and £20,620 is additional capital proposed to be created under the powers of this Bill. The profits of the company are limited to 10 per cent. on the original capital of £19,380, and 7 per cent. on the additional capital. The maximum price for gas is not to exceed 5s. per 1000 cubic feet.

GENERAL.

The small-pox scare has cost the Carnarvon Board of Guardians £350.

The weather having suddenly become cold in the States, the epidemic of influenza is decreasing.

The Southport Corporation intends acquiring a site outside the borough, by compulsion if necessary, for the erection of an infectious diseases hospital.

A Local Government Board inquiry has been held at Portsmouth into the application of the Town Council for power to borrow £5000 for an infectious hospital, &c.

The East Barnet Valley Urban District Council has resolved to provide a hospital for its district, and is taking the requisite steps to acquire a site by compulsory purchase.

The outbreak of small-pox in Bradford is assuming serious, though at present not alarming proportions. There were sixteen patients under treatment at the Bierley Hall Hospital last week.

A Local Government Board inquiry was held at Devonport recently with reference to the Corporation's application for leave to borrow £1574 for making footpaths and improving main roads at St. Budeaux.

Messrs. J. Stone and Co., of Deptford, are introducing a system of sewer ventilation in which water is employed as a means both to extract foul gas from the sewer and to purify it before it is discharged into the atmosphere.

The Sheerness Urban District Council has under consideration the advisability of purchasing and fixing a destructor for the disposal of house refuse. The Council now pays £25 per week to a contractor for removing the refuse from the houses.

Mr. Bicknell held an inquiry at Oldham last week, on behalf of the Local Government Board, into an application by the Town Council for sanction to the borrowing of £10,230 for a new police and fire-station, and dwellings for the men, at Fawnsfield.

The London County Council will, at its next meeting, be invited to pass a supplemental vote of £25,000 for additional features to the great scheme of protection against fire which was approved by the Council in February, 1898, and which will take more than ten years to carry out.

This week the Commissioner of the Metropolitan Police (Sir E. R. C. Bradford) has again caused to be circulated the following notice:—"Whereas many persons have received injuries from falls caused by treading on orange peel, banana, and other fruit skins, on the foot pavements, the Commissioner of Police earnestly requests that all persons will assist the police in preventing, as far as possible, orange peel or other fruit skins being thrown on the pavements, and in removing any that they may observe there."

A memorial has been deposited in the Private Bill Office of the House of Commons against the Scarborough Electric Tramways Bill by the Corporation of Scarborough.

At a special meeting of the members of the Holborn Borough Council, held on Monday night, Mr. Councillor Rawlings, Q.C., in the absence of his Grace the Duke of Bedford (Mayor), presiding, a bye-law was adopted declaring any member of the Council ineligible for office unless he had ceased to be a member for at least six calendar months. The same rule is to apply to the father or son, or the partner of any father or son of a member of the Council.

At last week's meeting of the Chelsea Borough Council the Public Baths Committee reported that it proposed to pull down the present public baths, and to utilise the existing and adjoining sites for the erection of new baths, which will cost, roughly, £70,000. In the course of the discussion it was stated that there was an annual loss of £1400 on the present baths. Ultimately the recommendations of the Committee were adopted by a large majority.

The Liverpool Sanitary Sub-Committee has passed a resolution, which has been approved by the Health Committee, on the report of the City Engineer, submitting application for 219 improved sanitary ashbins for use at certain premises assessed at £10 and under, "That the bins be supplied for the premises specified in the report, and that 10s. per bin be paid to the owners towards the cost of fixing the same and reinstating the premises."

Next Tuesday the London County Council will have before it a proposal to purchase, for £16,500, the two acres of land (with a 248ft. frontage to the Caledonian-road, Islington) on which the Royal Caledonian Asylum at present stands. The directors of the orphanage are desirous of removing their charges to a rural district; and the Housing Committee of the Council propose to purchase the site under Part III. of the Act, with a view to the erection thereon of dwellings to accommodate 1400 persons.

The Nordrach Sanatorium, Banchory, Aberdeenshire, is now practically completed, and will within the next fortnight be able to accommodate its full complement of patients. It has been built on a specially-selected site—in the midst of the Corsee Woods, the surroundings of which in many respects are unequalled in this country—for the purpose of carrying out the open-air treatment of consumption and other forms of tuberculous disease. Erected at a cost of £600 per bed—there is ample accommodation for thirty-six persons—the building may be said to hold its own with even the most elaborate and extensive in Europe. The system followed is, with slight modification, the same as that of Dr. Otto Walther.

Miss Alice Busk, a member of the late Vestry of St. George the Martyr, Southwark, gave an address on Saturday last at the United Girls' Schools Mission Settlement on "Women as Sanitary Inspectors." The Mayor of Camberwell, Mr. Matthew Wallace, C.C., was in the chair, and amongst those present were members of several South London Borough Councils. Miss Busk dwelt upon the success in St. George's of the women Inspectors of houses let in lodgings, which she said had led to the decision of the borough of Southwark to appoint five women upon its sanitary staff. She advocated the employment by the new Borough Councils of women for the Inspection of workshops, laundries, wholesale warehouses, &c., where women are employed; and the appointment of fully-qualified women to teach simple hygiene and health questions in the homes of the poor. In a discussion which followed, several gentlemen spoke in favour of the appointment of women for such work.

PERSONAL.

Mr. W. B. Seldon has been appointed Town Clerk for Bideford.

Mr. J. Jones has been appointed Clerk of Works for Carmarthen.

Mr. E. P. Veale has been appointed temporary Surveyor for Dartmouth.

Dr. Bailey has been unanimously re-elected Medical Officer for Horsforth for the ensuing year.

Dr. Lloyd Roberts has been reappointed Medical Officer of Health for the urban district of Prestatyn.

Dr. Duffield, after eighteen years' service, has tendered his resignation as Medical Officer of the Kensington union.

The Local Government Board has sanctioned the appointment of Mr. J. A. Perkins as Sanitary Inspector for Feckenham.

Dr. Wm. Robertson, Medical Officer of Paisley, has been appointed to a similar position in Leith, at a salary of £400 per annum.

The Local Government Board has sanctioned the appointment of Mr. Johnson as Inspector of Nuisances for Ashbourne, at a salary of £105 per annum.

Dr. George M'Kellar, Edinburgh, has been unanimously appointed Medical Officer for Kelso, in room of Dr. Wright, resigned. The salary is £20 a year. Dr. M'Kellar intends to reside in the district and take up private practice.

Dr. Arthur Mackenzie Wilkinson, of Melbourne, son of the Rev. H. J. Wilkinson, chaplain of the Victorian Forces, Australia, has been appointed by the Government of Victoria Physician-in-extraordinary to the Duke of York during his stay at Melbourne.

Mr. Ernest Jackling, Assistant Sanitary Inspector of Maidstone, has been appointed Inspector of Nuisances to the Corporation of the city of Rochester. Upon tendering his resignation to the Maidstone Urban District Council, they unanimously directed that a testimonial, signed by the Mayor, be presented to him as a mark of their esteem and satisfaction of the manner he had discharged his duties during the seven years he had been in its service.

Dr. J. Sutherland has been unanimously appointed Medical Officer for Kirkcaldy, at a salary of £100 per annum, in connection with his duties as physician to the Fever Hospital.

The vacancy in the Medical Officership of Leith, caused by the resignation of Dr. W. Leslie Mackenzie on his appointment as Medical Superintendent under the Local Government Board, has been filled by the unanimous election of Dr. William Robertson, Medical Officer of Health for Paisley, at a salary of £400. Dr. Robertson is a man of thirty-five years of age, and is a graduate of Glasgow University, where he took his M.B., C.M., with first-class honours in medicine and surgery, in 1888. He graduated M.D. in 1891, and D.P.H. in 1892. His experience of public health work began in Perthshire, first as Medical Officer of Health for the burgh of Auchterarder, and later in a similar capacity for the city of Perth. Upon his transfer to a wider sphere of usefulness as Medical Officer for Paisley, he displayed considerable capacity and energy. He re-organised the Public Health Department of the town, and he has been consulted by the Authorities in regard to a new infectious diseases hospital, a water scheme, and the erection of a sanatorium for consumptives. He also persuaded his Local Authority to co-operate with the School Board in initiating a scheme of systematic school inspection with a view to the early detection of infectious diseases. In addition to his varied administrative experience, Dr. Robertson has written a manual on "Practical First Aid."

NOTES AND QUERIES.

Subscribers may obtain advice on matters appertaining to Public Health Law and Municipal and Sanitary Engineering. Letters should be addressed "Notes and Queries," The Sanitary Record, 5, Fetter-lane, London, E.C. If an answer be required immediately, a stamped addressed envelope must be enclosed

2070.—Highway in Rural District: Exceptional Repairs. Appeal to County Council: Charge on Contributory Place. —"Surveyor" writes:—"The inhabitants of a parish in a rural district have petitioned the County Council respecting the condition of a district road, alleging neglect. The road in question is a moor road, with little or no traffic over it. The road has always been repaired with local stone, and is now in better repair than it has been for years. The residents, however, are determined to coat it with limestone or granite, and to have it well rolled. This, of course, will mean an enormous expense owing to the cost of material and carting, as the road is a considerable distance from a station, and is only approached by other steep roads. (1) Can the County Council compel the District Council to do this? (2) If so, can the Rural District Council charge the cost of the work upon the parish in which the road is situate, and what is the procedure?"

Answer.—A Parish Council or parish meeting may, under Sec. 16 (1) of the Local Government Act, 1894, resolve that a Rural District Council have failed to maintain and repair any highway in a good and substantial manner, and may complain to the County Council. If the latter body are satisfied after due inquiry that the District Council have so failed as respects the subject matter of the complaint, they may resolve that the duties and powers of the District Council for the purpose of the matter complained of, shall be transferred to the County Council, and they shall be transferred accordingly or by Sub-sec. 2 of the same section the County Council may make such an order as is mentioned in Sec. 299 of the Public Health Act, 1875. But if, as stated by the querist, the road has been, and is now, well repaired, the County Council will, in our opinion, refuse to make any order, and declare that the complaint is not well founded. (2) The District Council are enabled under Sec. 29, Sub-sec. (*c*) of the Local Government Act, 1894, to charge highway expenses under exceptional circumstances on a contributory place as a highway board has in respect of any area under Sec. 7 of the Highways and Locomotives (Amendment) Act, 1878.

2071.—Infectious Hospital: Recovery of Cost of Maintenance. Parents not Liable in Respect of Cost of Children.—"Clerk" writes:—"My Council is a subscriber to your journal. I am desirous of being informed of any case where an Urban Authority has claimed through the County-court to recover the cost of maintenance in a hospital of a patient under Section 132 of the Act of 1875."

Answer.—We are unable to refer our correspondent to any report of County-court proceedings for the recovery of cost of maintenance of patients in infectious hospitals. Doubtless some of our readers may be able to assist with information, as such reports generally appear in local newspapers only. The Council may recover the debt in a Court of civil jurisdiction, such as the High Court or the County-court. It cannot be recovered summarily before magistrates. And in any case the debt can be recovered only from the patient himself, not from his parents. In Hull Corporation *v.* Maclaren, Q.B.D., May 20th, 1898, the County-court judge had given judgment against the father of a child who had been treated at a hospital belonging to the Corporation for £6 7*s.* in respect of the child's maintenance. This judgment was, however, reversed by the High Court. Ridley, J., said, "I am of opinion that the decision of the learned County-court judge cannot be upheld. It is clear from the note which the learned judge has supplied to us that he was under the impression that the liability for the maintenance of the child was cast on the father by the Public Health Act, 1875. But from a perusal of Section 132, on which the Corporation relied, it is evident that such liability is cast on the patient only. The real question which should have been considered below was whether apart from the statute the parent had contracted either expressly or by implication to pay for the maintenance of his child in the hospital. But that question was not considered by the learned judge, nor are we entitled to consider it here, though I think it is clear that the parent did not agree to pay for the maintenance of the child. The real point was not considered; under the statute no such liability is cast on the parent. The appeal must succeed."

2072.—Public Health Highway Acts: Editions Recommended.—"Surveyor" writes:—"Would you kindly advise on the following: (1) Is there a collection of the Acts of Parliament such as Highway, &c., Acts, other than the Public Health Acts, which are required by a Surveyor to an Urban District Council? (2) What Acts, outside of the Public Health Acts (which I have at present in Knight and Co.'s edition) are required,

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and what would be their approximate cost, such as Building in Streets Acts; Towns Improvement Clauses Acts; Tramways Act, 1870; Waterworks Clauses Acts, Private Street Works Acts, &c.?"

Answer.—For municipal engineers and surveyors in practice who require to obtain a sound knowledge—which is extremely essential for their own success, and the proper and efficient discharge of their duties—of the Public Health and other Acts under which they have to work, there are two publications which are indispensable, viz., Macmorran's "Public Health Acts," in two vols., price 67s. 6d., post free 55s. 6d., and Pratt's "Law of Highways," price 32s. 6d., post free 26s. 9d. These volumes contain all the Acts mentioned by the querist, and are fully annotated, enabling the lay reader to interpret their meaning with a degree of satisfaction and confidence which is not possible by the perusal of statutes such as those he possesses and suggests which are not annotated. Handford and Mackenzie's "Model Bye-laws," two vols., price 25s., post free 20s. 9d., is also a desirable and necessary publication, which should be in the library of a municipal surveyor. Any of the books may be obtained from the office of this journal.

2073.—Burgh Police (Scotland) Act, 1892: What is "Sufficient" Repair?—"Manu Forti" writes:—"A Town Council is about to pass a resolution in terms of Sec. 142 of the Burgh Police (Scotland) Act, 1892, to undertake the maintenance and repair of all footways in the burgh. Can they by virtue of that resolution order a proprietor to lay down granolithic paving in substitution for a gravel footpath now existing, or can they only order the proprietor to 'repair' the gravel footpath? (2) On the other hand, can a Town Council, ignoring Sec. 142, proceed in terms of Sec. 141 to require all owners of footpaths in the burgh to construct footpaths to their satisfaction, and if so, what purpose does Sec. 142 serve? (3) Can a Town Council in a Scotch burgh, where the footpaths have not been taken over in terms of Sec. 141 or 142 of the Act, ask the owners thereof to repair the same without becoming responsible thereafter for their maintenance, and if so, by what Act?"

Answer.—In our opinion, although the matter is one which is not entirely free from doubt, the expression "to have their foot pavements before their properties put in a sufficient state of repair," includes the paving in such a manner as to constitute it in such a "sufficient state of repair" as the Commissioners may decide, and this, we think, is borne out by Sec. 143, which is a corollary to it, which gives the "person whose property is affected, and who thinks himself aggrieved, to appeal to the Sheriff as regards the making, altering, paving, or causewaying, and maintaining streets and foot pavements." (2) The provisions of Sec. 141 apply to the case of any new street; or any other individual street in the burgh which the Commissioners may determine at an ordinary meeting of the Council, shall have the footways well and sufficiently paved. In Sec. 142, however, the provisions can only be put in force "by resolution at a meeting *specially called for the purpose* to undertake the maintenance and repair of *all* the footways of the burgh." (3) Yes. See Sec. 135 of the same Act.

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2074.—Drain or Sewer: Combined Drain Emptying into a Cesspool Not a Sewer.—"T. E. W." writes:—"An owner requires me to clear a drain which is choked. The drain empties into a cesspool which we are bound to empty, and which I have had done. The owner maintains, as there are eight houses connected to the drain, it becomes a sewer and repairable by the Council. Inasmuch, however, as it is not connected to the public sewer, I maintain it is not repairable by my Council. Will you kindly advise me on the subject?"

Answer.—There is, in our opinion, no obligation on the part of the Local Authority to cleanse the drain, as it is not a sewer which is vested in them. In Meader *v.* West Cowes Local Board 1892, 3 ch. 218; 61 L.J. ch. 561; 40 W.R. 676, Lopes, L.J., held that a thing which does not carry away sewage cannot properly be called a sewer, and Lord Coleridge, C.J., in that case took the same view. Accordingly a pipe which carries the sewage of two or more houses into a cesspool is not a sewer within the Public Health Acts which vests in the Local Authority. The decision in this case was followed in Button *v.* Tottenham Urban District Council, 62, J.P., 423.

2075.—Bye-laws as to Drainage of Existing Houses.—"A. J. M." writes:—"I should be glad if you could give me the name of any Urban Authority who have adopted a good set of bye-laws regulating the construction of drains to old or existing houses."

Answer.—As we pointed out in our reply to Query 2067, in our issue of the 17th inst., the Urban District Council of Carshalton, Surrey, have adopted bye-laws with respect to the drainage of existing buildings.

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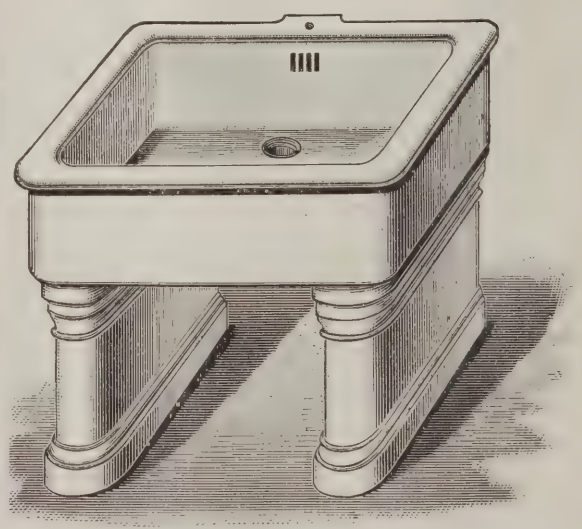

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A SUGGESTED METHOD OF PREVENTING WATER-BORNE ENTERIC FEVER AMONGST ARMIES IN THE FIELD.*

By Louis Parkes, M.D., D.P.H., Medical Officer of Health for Chelsea, and Samuel Rideal, D.Sc., F.I.C.

(*Concluded from page* 64).

As regards acidity, the same amount of acid, as measured by decinormal soda solution, appears to be required to produce a similar result in nitro-hydrochloric acid (dilute B.P.), and sulphuric acid (dilute B.P.), sodium bisulphate in the proportion of one gramme to the pint contains about two and a-half times the acidity of twenty minims of sulphuric acid (dilute B.P.). If anything, the nitro-hydrochloric acid appears to be most efficient *quâ* acidity; and this is intelligible when it is recollected that there is likely to be a small quantity of free chlorine in this acid—chlorine having very marked disinfectant properties. The citric and tartaric acids, to be efficient, must contain at least three times the amount of acid, as measured by decinormal soda solution, that is sufficient for nitro-hydrochloric and sulphuric acids.

Experimental trials were also made with acid sodium phosphate, and with sodium sulphovinate, but they were found to be inefficient.

In order to show that the presence of 1 c.c. of the acid solution in the agar does not affect the capacity for growth of the *Bacillus typhosus*, an experiment was made by adding some of the blank infected water directly to agar tubes containing 1 c.c. of the acid solution. After twenty-four hours incubation, at 37 deg. Cent., the plates showed very numerous colonies in every instance.

Experiment II.

Eight hundred cubic centimetres of boiled tap water infected with two drops of a twenty-four hour broth culture of *Bacillus typhosus* at 37 deg. Cent.

Agar plate cultures made with 0·2 c.c. of the mixture.	Results obtained after contact of infected water with acid solution for periods of	
	5 min.	15 min.
Sodium Bisulphate—		
1 gramme per pint of infected water	6 cols.	B. Typh. killed
Tartaric Acid—		
1 gramme per pint of infected water	120 cols.	50 cols.

The tap water was boiled, and then cooled before infecting, in order to kill the few organisms present capable of growth at blood-heat in the agar, and so facilitate the subsequent counting of the typhoid colonies.

Experiment II. is confirmatory of Experiment I., but the typhoid bacilli in this experiment were either more numerous or more resistant than in Experiment I., as the results are not quite so good. The water was infected with two pipette drops of the broth culture instead of with one; on the other hand, only one-fifth c.c. was used for plating the agar, instead of 1 c.c. as in Experiment I.

The inferiority of tartaric acid to sodium bisulphate (equal strengths of each being used) is well shown in this table.

Experiment III.

One hundred cubic centimetres of boiled tap water infected with 1 c.c. (approximately 20 drops) of a twenty-four hour broth culture of *Bacillus typhosus* at 37 deg. Cent.

Sub-cultures made into broth tubes (incubated for forty-eight hours) by three platinum wire loopfuls, after contact of infected water with acid solution for periods of—

—	7½ mins.	15 mins.	30 mins.	45 mins.	60 mins.	2 hours.
Sodium Bisulphate.						
1 grm. per pt. of infected water	+	+	+	−		
0·75 grm. ditto...			+	+	±*	
0·5 grm. ditto				−	−	+
Tartaric Acid.						
1 grm. per pt. of infected water	+	+	+	+		
0·75 grm. ditto...			+	+	+	
0·5 grm. ditto				+	+	+
Sulphuric Acid, dilute B.P.						
20 minims per pt. of infected water	+	+	+	+		
15 minims ditto			+	+	+	
10 minims ditto				+	+	+

* Growth after forty-eight hours somewhat inhibited in the sub-culture.

Experiment III. shows that when a water is heavily infected with culture of *Bacillus typhosus* (to the extent of one per cent.), the time of contact must be very materially increased to prevent subsequent growth of the bacillus in broth. Sodium bisulphate (one gramme per pint of infected water) is then only effective if contact has been made for forty-five minutes. Tartaric and sulphuric acids in similar strengths did not prevent the subsequent growth of the bacillus after forty-five minutes contact.

Experiment IV.

Five hundred cubic centimetres of boiled tap water infected with one drop of a twenty-four hour broth culture of *Bacillus typhosus*. Four different cultures were used, marked respectively J 1, R, B, and M, thus making four infected waters. The one marked J 1 was found to contain 9120 cols. of *Bacillus typhosus* per 1 c.c.

Agar plate cultures made with 1 c.c. of the mixture.	Results obtained after contact of infected water with acid solution for periods of				
	3 mins.	7 mins.	10 mins.	15 mins.	30 mins.
Sodium Bisulphate.					
1 grm. per pt. of infected water, J 1	Numerous, but greatly reduced*	50	3	0	0
Ditto, R.	Very numerous	200	24	0	0
Ditto, B.	Numerous	140	14	0	0
Ditto, M.	Very numerous	200	Plate spoilt	0	0

* Greatly reduced when compared with the blank (control experiment).

Experiment IV. was made to ascertain if any variation arose from the use of broth cultures of *Bacillus typhosus* of different origins. The one marked J 1 was used in the preceding experiments. The others, marked R, B. M, were kindly forwarded to us by Dr. Savage, of Cardiff,

The results, on the whole, show but comparatively little divergence, having regard to the fact that the waters were infected with four different cultures of varying degrees of remoteness from their original stocks.

It may be used as an argument against the deductions which we think that we are entitled to draw from our experiments, that in broth cultures of *Bacillus typhosus* the organisms are living under artificial conditions, and that waters infected by natural means derive the living virus directly from the fæces or urine of an enteric fever patient. There would be reason in such

* A paper read before Epidemiological Society, Friday, January 18th, 1901.

a line of argument, if it could be shown that the bacilli on emerging from the human body are more resistant to adverse agencies, such as our chemical solutions are, than those which have been cultured and sub-cultured in broth.

That this is not generally held to be so is now recognised; for the probabilities are in favour of the view that pathogenic organisms by propagation in artificial media outside the human body tend to become saprophytic; and whilst very probably losing in virulence, yet acquire higher resistant powers to agencies affecting their life and growth than they ever possessed when they flourished as parasites in the human body. The two properties of virulence and resistance to external destructive agencies must be clearly differentiated. We think there is every probability that the agency which proves fatal to the sub-cultured bacilli would have an equal, if not greater, effect upon organisms of high virulence immediately derived from the excreta of an enteric fever patient.

EXPERIMENT V.

(1) Seven hundred and fifty cubic centimetres of boiled tap water infected with three drops of a twenty-four-hour broth culture of *Bacillus typhosus* (approximately 0·2 of broth culture to 1000 of water—1 c.c. yielded 12,000 colonies).

(2) Five hundred cubic centimetres of boiled tap water infected with five drops of a twenty-four-hour broth culture of *Bacillus typhosus* (approximately 0·5 of broth culture to 1000 of water).

(3) Four hundred cubic centimetres of boiled tap water infected with eight drops of a twenty-four-hour broth culture of *Bacillus typhosus* (approximately 1·0 of broth culture to 1000 of water—1 c.c. yielded 52,000 colonies).

Agar plate cultures made with 1 c.c. of the mixture.	Results obtained after contact of infected waters (1, 2, 3), with acid solution for periods of :—	
	15 min.	22 min.
Sodium bisulphate. 1 grm. per pt. of infected water ...	Sterile.	—
Three 5-grain tabloids* per pt. of infected water	100 cols.	2 cols.

* The tabloid took seven minutes to dissolve. It only contains 73 per cent. of the theoretical amount of acidity a 5-grain tabloid of sodium bisulphate should contain, showing that about one-quarter of the tabloid is made with some inert substance. The experiment was made with No. 1 water only.

Experiment V. shows that sodium bisulphate in the proportion of one gramme per pint is effective after fifteen minutes' contact, even for waters containing as many as 50,000 colonies of *Bacillus typhosus* per 1 c.c. The tabloid of the same substance takes some minutes to dissolve; and, as it contains some twenty-seven per cent. of inert matter, it is not surprising that the results obtained with it are less successful than those obtained with the pure chemical.

This experiment leads us to the consideration of the dose of the poison, or the number of bacilli which must be imbibed in order to induce the disease—a subject on which practically nothing certain is known.

On the one hand, waters which were believed on well-founded grounds to have been productive of outbreaks of enteric fever have been bacterioscopically examined—usually several weeks, however, after the period at which they were supposed to be infective—and no typhoid bacilli have been isolated. On the other hand, it is now known that in some 25 per cent. of all cases of enteric fever the urine, during the later stages of the disease, and during a prolonged convalescence, may be teeming with *Bacillus typhosus*, in some cases being actually turbid from the presence of many millions of these organisms per c.c. It will be easily understood how, if but a small quantity of such urine finds its way into drinking water, such water may become infected with bacilli exceeding in numbers per c.c. any of those which have been artificially manufactured in the laboratory during the course of our research; although from Experiment III. it appears that sodium bisulphate has a considerable effect, even when pollution to the extent of 1 per cent. has occurred.

It is reassuring, however, to know that it is only in about 5 per cent. of these cases of infective urine (P. Horton Smith, *Lancet*, May 20th, 1899) that this liquid is rendered turbid by the presence of the bacilli; so that the condition is only actually present in about 1·25 per cent. of all cases of enteric fever. It is very doubtful also if the bowel excreta at any time contain bacilli at all comparable in numbers with those now known to be occasionally present in the urine of convalescing patients.

On the whole, it would appear as if we might be justified in assuming that (1) water naturally infected with the virus of the disease does not contain so very large a proportion of the bacillus; that (2) this organism is not by any means resistant to acids or other weak disinfectants; and (3) that the use of such simple means as here suggested by us, for combating infection, has possibly a future before it, more especially under conditions of life where the means of sterilisation by boiling and filtration are not readily available.

As regards the use of sodium bisulphate during a campaign, we would recommend its being employed in the form of tabloids—each tabloid to contain five grains of the bisulphate. The tabloids should be made to dissolve quickly in water, and for this purpose the minimum quantity of gum arabic or other adhesive substance should be used in their manufacture. The tabloids should be put up in well-made light metallic boxes, to hold about a quarter of a pound weight—equivalent to about 350 tabloids—enough to sterilise over 100 pints of water at the rate of three per pint. One of these boxes should be carried by every soldier in his haversack. Supposing the soldier to consume five pints a day when on the march, the quarter of a pound tin would suffice for nearly three weeks, at the end of which time he will probably again be in touch with his transport.

Instructions should be given by the Medical Officer to the rank-and-file as to the use of the tabloids, and more especially as to the desirability of allowing all contaminated water to remain in contact with the dissolved tabloids for at least fifteen minutes before being consumed. The soldier of the future, it is now recognised, must have more intelligence and more individual initiative; and this should extend as much to the care of his health, when in camp or on the march, as to his action on the battlefield.

The acid tabloids will be found to render the water much more effective in slaking thirst, and there will, in consequence, be less inclination to drink large quantities of water, a smaller quantity when acidulated sufficing. The tabloids may also be used as thirst lozenges when water is scarce, and will, we believe, be found to be useful by promoting the secretion of saliva, and so preventing parching of the mouth.

We are informed by an officer, recently returned from the war, that he found the "thirst lozenges" he took out with him from England most useful. There was an immense demand for them by the men of his company; and the men who took them were satisfied with much less water than those who failed to obtain any.

In a country such as South Africa, where the heat of the day is generally very great, and water is scarce and often polluted, it seems very desirable that something should be done, both to diminish the inevitable sufferings of our soldiers from thirst and to protect them from the ravages of water-borne disease.

THE VENTILATION OF SEWERS.*

By H. Gilbert Whyatt, A.M.I.C.E., Mem. San. Inst., Borough Engineer, Grimsby.

(*Concluded from page* 46.)

The use of tall chimney shafts.—Many towns have attempted to ventilate the sewers by connecting them with tall chimney shafts placed above the ground—either special chimney shafts built for the purpose with coal or coke furnaces always burning at the bottom, or by connections with factory chimneys actually in use, in both of which cases there would be powerful draughts.

It was supposed that the strong draughts thus produced would draw the noxious sewer air from all the sewers for very considerable distances, and this expedient if successful would have been a most excellent and commendable sanitary improvement in connection with the sewage of towns, as all the foul air from the sewers would have been discharged at a considerable height above the ground. It has always been found, however, that the ventilating effect of any such shaft is only local, that is to say, the air to supply the draught is drawn from the nearest inlet, and hence has no effect, except in a very short length of the sewer.

It will be seen from the tabulation in Appendix No. 1, that only one town has made any extensive use of chimney shafts, and the Borough Engineer of Gloucester expresses the opinion that "they are not worth the extra expense over an ordinary six-inch shaft."

The use of house chimneys.—It has been suggested by one or two sanitary engineers to use house chimneys for the purpose of ventilating sewers. I do not think that this would be at all advisable. The ordinary house chimney is so poorly pointed and pargeted on the inside that there would be great risk of sewer gas leaking through into the building.

One such instance occurred in 1896, where the King's Norton Rural District Council connected a ventilating shaft into a chimney, the owner died, and the executors brought an action for damages. The jury found that the Local Authority had been negligent, that sewer gas had escaped into the house, and that the fatal illness of the gentleman resulted therefrom; and they found for the plaintiffs damages £3500.

Sewer gas destructors.—Some years ago a patent was brought out for drawing out sewer air from the sewers and cremating it in a little furnace constructed at the bottom of a lamp pillar. They are constructed to burn about 8 cubic feet of gas per hour, and at 2s. 6d. per 1000 cubic feet this represents an annual outlay of nearly £9. Capitalising this at thirty years, we have a total of £270, to which should be added the cost of the lamp, say £15, making each sewer gas destructor equal in cost to a lump sum payment of £285 for dealing with the sewer gas at that particular point.

Many towns have fitted one or two as an experiment, but owing to their great cost their use in many cases has been abandoned.

Lamp columns as ventilators.—It has been suggested that each lamp pillar should be so arranged as to be a tube connected with the sewers and acting as a ventilator. I find, however, on inquiry from Mr. W. A. Vignoles, the Borough Electrical Engineer, that there is some electrical apparatus inside of each of the lamp pillars about to be erected by his committee. This would be likely to be very injuriously affected by the sewer gases, and I think he would therefore recommend his committee not to allow the poles to be used for this purpose.

In Southport over 200 lamp posts are used as sewer vents, and are so generally unnoticeable that no complaint of nuisance arising from them is ever made.

I suggest that your committee should consider whether some of the lamps in those streets which are not to be lighted by electricity should not be altered so as to ventilate the sewer in the street.

Property owners' objection to vent shafts.—In many towns the property owners object to vent shafts from sewers being fixed to their property, but I have so far found that this objection is not met with in Grimsby. In some towns where a manhole is put opposite property a ventilating cover is fixed, unless the adjoining owner will give consent for a vent shaft being fixed to his property; and in other towns where a nuisance from a manhole is complained of, the manhole is only closed upon condition that the adjoining owner allows a vent shaft to be erected on his property.

Ventilation of drain between sewer and trap.—I have already mentioned that in many cases in Grimsby this particular length of pipe becomes "air-locked," or tide-locked, and I find on perusal of the reports of the engineers of other boroughs that the same difficulty is met with elsewhere. This difficulty can be got over by placing a vent pipe on this length of drain carried up above the adjoining buildings, and from the replies to queries it appears that in Torquay over 2000 of these have now been erected.

I have suggested this pipe to various builders in Grimsby since I took up the duties here, and it has been in five cases erected by them without any objection, whilst the erection of thirteen others is now in progress. If this could be generally insisted upon, it would be a great benefit to the sewers of Grimsby. I think that, in view of the present powers possessed by the Corporation, it can be everywhere insisted upon in the future.

It must be admitted that since the duty of ventilating the sewers devolves upon the Corporation under the section quoted above, the cost thereof must also be borne by the Corporation; but these lengths between the sewer and the trap are single private drains, and the duty of ventilation rests upon the owner.

Rust pockets.—In connection with all ventilation shafts it is impossible to paint them internally after they are fixed; and, consequently, after a year or two a large amount of rust forms on the inside, and falls to the bottom. It is the universal experience of Sanitary Engineers that vent pipes after a few years cease to act, unless an adequate rust pocket at the base is constructed. In all pipes erected by the Corporation it is easy to arrange for this being done.

I suggest that pressure be put upon builders of property to construct these rust pockets at the bottom of each vent shaft, both on the vent to be placed in the length of drain between the trap and the sewer, and on the vent at the upper end of each house drain; and in view of the powers possessed by the Corporation I think this can be done.

The flushing of sewers.—The importance of frequent and copious flushing, so as to effect the removal of silt and putrefying sediment as soon as possible, cannot be over-rated. It has been suggested that the flushing caused by heavy rain storms is more effective than that done by the Corporation, because in times of storm sand and grit are washed into the sewers with the rain and scour the interior of the pipes; and hence it is that after heavy rains surface ventilators are less offensive than at other times; but it is equally probable that a heavy rain storm gives an adequate flush to the intercepting trap on the house drains, and thus all semi-decomposed sewage is removed out of the sewers.

Present flushing arrangements.—The gradients of the sewers in Grimsby are very flat, and consequently very few of the sewers are self-cleansing. It has been found necessary, therefore, to make special arrangements for flushing the sewers in order to wash out the sediment and keep them clean. A list of them will be found in Appendix No. 4. The majority of these require the attendance of a workman, and therefore it is possible for the flush always to be made when the tide is low, and

* Report to Special Sub-committee of the Council, county borough of Grimsby.

the penstock doors at the sewage pumping station are open.

The automatic flushing tank at the corner of Stirling-street and Weelsby-street is supplied with water from the Corporation distributing mains, and is arranged to go off at intervals, irrespective of whether the tide is high or low, or whether the penstock doors at Riby-street are closed or open. I suggest that it should be part of a workman's duties to attend at this tank at say 3½ hours after high tide to open the valve, so that the tank may be discharged at half-hourly or hourly intervals, and that he should entirely close the valve 3½ hours before the next high tide; so that on the average there will be 4 hours' flushing at short intervals out of every 12. It is possibly not necessary for this to occur during the night, and it is simply a question for your committee to decide as to whether they agree to pay extra for night work.

The flushing places in connection with the Haven consist of pipes with valves connected from the Haven into the sewer; the idea of the arrangement being this, the water in the Haven is directly connected to the sea at high tide when the Union Dock gates are opened; immediately after high tide these gates are closed, and the water is held up. About four hours after high tide the Corporation workmen open the valves and allow sufficient quantities to flow from the Haven into the sewers. But it is found on the majority of days in the month, that, owing to the large traffic through the Union Dock, and the number of times the lock has to be opened for the passage of vessels, the water in the Haven has sunk to so low a level as to be below the valves, and hence it is impossible for the flushing to take place. I suggest that at each of these places a tank should be constructed, so arranged as to automatically fill at high tide from the Haven, and to remain full, although the water in the Haven lowers, and then at about four hours after high tide the workman by opening an outlet valve may flush the sewers. This would necessitate the construction of five tanks of 5000 gallons capacity.

In Lambert-road there is a fresh-water pipe from the Park Lake, from which it is possible by closing a penstock to divert the water into the Lambert-road sewer, and to flush Ainslie-street; and also a pipe from the fish-pond in the grounds of the Abbey, from which it is possible, by opening penstocks, to flush either westwards along Lambert-road and the Abbey Park-road sewer, or eastwards to accomplish the same flush as from the Park overflow sewer.

In Heneage-street, near the corner of Margaret-street, there is a fresh-water culvert across the sewer, and here, by placing a shutter in the fresh-water culvert and opening a penstock in the sewer, it is possible to flush the main sewer along Heneage-street. There are three other positions, as seen from Appendix No. 4, where a similar arrangement exists.

There are thirty-four places where hydrants are placed upon the Corporation water pipes, and by opening these the sewers can be flushed with the subsoil water pumped into the tank at the Riby-street pumping station.

In addition to these fixed points, the Corporation possesses a wrought iron flushing tank on wheels, containing about six tons of water, or 1340 gallons. This tank can be wheeled to any part of the borough, filled with water, and made to discharge into any sewer or drain to which access can be obtained through gullies, ventilators, manholes, or by openings specially made for the purpose.

Syphons and flap valves in sewers.—It has been found necessary at several places in the sewers of Grimsby to carry the main sewers under the fresh-water culverts by means of syphons, and thus at each end of the syphon there is practically a "dead end" so far as the passage of air is concerned.

At other places flap valves have been placed at the ends of sewers discharging into other sewers, in order to prevent any flood in the main sewer backing up into the tributary sewer. These likewise form a "dead end." I suggest that in each of these cases a vent shaft should be put in as near the "dead end" as possible. A list of these places will be found in Appendix No. 2.

The Pyewipe outfall and Haycroft drain.—Previous to the construction of the Alexandra Dock the Haycroft drain meandered through the West Marsh across the site of the dock, discharging itself close to the ship-building yards; but when the Alexandra Dock was constructed this was diverted at the expense of the railway company, and a new road was made on the west boundary of the borough with the main sewer running down the centre of it. I understand that this has very few manholes upon it, and that these have closed covers.

At the outfall there are doors hung in the ordinary way upon hinges, so that at low tide the flow of water along the outfall keeps the doors open; and when the tide rises above the level of the water in the culvert the tide flows in and the current closes the doors. The result is this, that when the wind is from the north-west, north, or north-east, and these doors are open, the wind blows into and along the culvert, and the whole of the foul odours in the culvert are discharged in the neighbourhood of Lord-street, Lime-street, and Macaulay-street. When the wind is in any other direction this stream of air through the culvert does not exist. When the gates at the outfall are shut and the water is backed up in the culvert by the closed doors and rising tide, the whole of the air displaced by the water is driven out and discharged in the district just named. Your sub-committee noticed this effect on the occasion of their visit on the 10th instant. I suggest that an arrangement should be made with the railway company for the erection of adequate ventilation shafts at intervals along the length of this sewer, and that an attempt should be made to utilise the chimney of the biscuit factory (lately burnt down), which is close to the line of drain. A properly-constructed curtain should be placed in the sewer in the vicinity of Lime-street, in order to prevent the sewer gas being discharged in this neighbourhood.

Having laid the whole of the facts of the case before his Council as above, Mr. Whyatt makes the following recommendations:—(1) All manholes which have been complained of during the last two or three years to be at once closed, and to have a shaft erected communicating therewith. Where possible this shaft should be placed on the sunny side of the street, in order that as far as possible the heat of the sun may assist the up-draught. (2) In those cases where the sewers are syphoned under culverts, or where flap valves are put in to act as gas checks and regulators, a shaft to be at once placed at each side of the syphon or valve. (3) A shaft to be placed at every "dead end" in the sewers. (4) Where manholes are complained of in the future, close them only upon facilities being given for the erection of a shaft on the adjoining property. (5) To insist upon a vent shaft being placed on the sewer side of each intercepting trap (such shaft to be provided with a rust pocket) in order to vent the length of drain pipe between the trap and the sewer. (6) To at once arrange for the ventilation of the Pyewipe outfall, so as to prevent the whole of the air of this mile of sewer being discharged in the neighbourhood of Lime-street, Lord-street, and Macaulay-street. (7) To alter such flushing arrangements as now exist, so that they shall not discharge into the sewers during the periods when the penstock doors are closed at the sewage pumping station in Riby-street. (8) To construct underground tanks or cisterns alongside the Haven, so arranged as to automatically fill from the Haven at high tide, and to be discharged by an attendant at 3½ or 4 hours after high tide.

Important Notice.—Will any reader who may have sent money to a Mr. Ashton, a tutor for Sanitary Examinations, kindly communicate with the editor.

ARSENIC IN BEER.*

(*Concluded from page* 70.)

PROCEDURE ON DISCOVERY OF ARSENICAL SAMPLES.

From time to time, as the inquiry proceeded and the analytical work progressed, the County Analyst notified the discovery of any arsenical samples to the Clerk of the County Council, who at once communicated with the sellers, cautioning them against the serious risks they ran unless they immediately ceased to sell the arsenical beer. It will be remembered that, after carefully considering the question, the Committee decided not to take proceedings under the Act unless in the unlikely event of a second offence, or if any person, after a reasonable time, was detected selling arsenical beer. Of course, now that the circumstances are well known to every brewer and publican in the kingdom, no leniency can be looked for if such beer is again discovered to be on sale.

It followed, as a matter of course, that the official caution sent to the beer-seller was passed on to the brewer, but, irrespective of this, I thought it advisable to call personally upon the implicated brewers in order to ascertain, if possible, what steps they had taken, or proposed to take, to stop the sale or consumption of all beer which had been brewed with the particular glucose which, by this time, was known to be the cause of the trouble. This was the only information which, in the first instance, I hoped to obtain, and I must say I approached the brewers with a considerable amount of diffidence, not knowing, under the circumstances, how my visit might be received. As it turned out, however, I was received, without exception, with the utmost courtesy, and, besides obtaining the comparatively limited information sought for, I was supplied with further details which proved of the utmost value in elucidating certain circumstances attending the distribution of the cases of poisoning throughout the county which otherwise would have remained obscure.

I may here state that, with one exception, the implicated brewers had used glucose supplied by Messrs. Bostock and Co. The exception was one of the breweries in an adjoining county, and upon further inquiry, I found that the public-house where the sample was obtained was not a tied house, and the probability is that the beer sold to the Inspector had been obtained from some other source. At any rate, the brewer who was supposed to be implicated assured me that he had only once used "Bostock" glucose, and that the small stock he had of it was exhausted more than twelve months ago. He also showed me the certificate of a well-known chemist testifying to the purity of all his beers and brewing materials.

STEPS TAKEN TO STOP THE SALE OF ARSENICAL BEER.

As regards the implicated brewers, I ascertained from each, step by step, the measures taken to put a stop to the sale of the arsenical beer. They also informed me as to the exact dates on which the steps were taken, and I had opportunities of verifying the information in most cases by documentary evidence in the shape of letters, telegrams, &c.

I need not go into detail regarding the steps which were taken by each firm, as a general account will, no doubt, be considered sufficient, especially as I am in a position to state that in every case prompt action was taken, and I believe time will prove that the desired result has been attained.

It appears that soon after the scare arose, Messrs. Bostock and Co. communicated with some of their customers, asking them to discontinue brewing with the glucose they had supplied, as they had reason to doubt its purity, and that they would write again. After two or three days' interval, a second communication was received to the effect that the glucose might be used with safety, and immediately following this a third letter to say that the glucose, after all, was found to be arsenical, and that they would be glad to have it returned. I am glad to say that the brewers did not await the ultimate outcome of these vacillating communications, but took steps to satisfy themselves regarding the quality of the glucose by obtaining independent analyses, with the result that in every case the glucose was pronounced to be arsenical.

Upon this, prompt steps were taken to recall the arsenical beer, but as may be imagined, this could not be accomplished in a day. In some cases the beer was immediately discharged into the sewers either on the spot or at the brewery. In other cases it was locked up either at the public-houses or at the brewery, to be destroyed in the presence of the Excise Officers, in the hope that the duty charged upon it will ultimately be rebated. As far as possible, private customers were also communicated with, and on the whole, from what I could ascertain, I believe every effort was made to put a stop to the consumption of the arsenical beer, and at the present time I feel pretty confident that none is on sale. Possibly, for a little time minute traces of arsenic may still be found in beers, for the reason suggested by the County Analyst that the brewing vessels may impart slight contamination to the beers that are now being brewed from pure materials—in fact he suggests that this is the probable explanation of the traces of arsenic present in seven of the samples analysed—time, however, will remedy this, and, meanwhile, the amount of arsenic which can thus be imparted to beer is so infinitesimal that it may be disregarded from a health point of view.

AMOUNT OF GLUCOSE USED IN BREWING.

Having regard to the fact that the use of arsenical glucose was the sole cause of the trouble, it is evident that the degree of contamination of the beer would vary in accordance with the amount of such glucose used by different brewers. In this respect the practice varies considerably, and the quantity has no fixed relationship to the amount of malt used. Among those brewers who have been good enough to supply me with the information, I find that the proportion of glucose used to malt varies from 12 to 33 per cent., and that the actual amount of glucose, say per barrel of beer, varies from 6·6 lb. to 22·4 lb., and this, when reduced to gallons, gives a range of from 2·9 oz. to 9·9 oz.

Such is the practice in the case of beers brewed for ordinary public-house consumption, but the reason for the extreme diversity in the amount of glucose used by different brewers is not very apparent. The brewers state that they brew to suit their customers, whose tastes are said to differ in different localities. In fact, one brewer informed me that the "fashion" in this respect differs so much, even in adjoining districts, that he is obliged to brew two distinct and very different qualities of beer to satisfy the wants of two artisan communities situated only a mile or two apart.

In the case of three of the implicated brewers, however, another factor came into play which still further accentuated the difference in degree of contamination of beers brewed by firms using Bostock's glucose. The three brewers in question had been in the habit of using, in the same brew, a mixture of glucoses, all of which, with the exception of Bostock's, were free from arsenic, and thus, in accordance with the total amount of glucose used, and the relative amount of the pure and impure article in the mixture, so the degree of impurity.

Given, then, a certain amount of arsenic in a certain glucose, used either alone or in combination with other

* Abstract from Report of Dr. Geo. Reid, County Medical Officer, Staffordshire, January 16th, 1901.

non-arsenical glucoses, the degree of contamination of the beer would be regulated, first, by the amount of glucose used, and, secondly, by the practice, when it is adopted, of mixing glucoses and the extent to which the mixing process is carried—in other words, the amount of arsenical dilution effected by the mixing.

PROBABLE EXPLANATION.

In view of what I have just stated, the comparative absence of arsenical poisoning cases in the populous towns in the north of the county is explained, for, although a large number of the public-houses in these towns were supplied with arsenical beer, it so happens that the implicated brewers not only used a moderate amount of glucose, but also lessened the arsenical quality of what they did use by brewing with mixed glucoses; thus in the case of one large brewery the arsenical glucose was diluted to the extent of two-thirds, and in two other cases to the extent of one-half. If in place of using mixed glucose, the three brewers referred to had used Bostock's glucose only, the quantity of arsenical glucose per gallon of beer would have amounted to 4·5 oz., 5·3 oz., and 5·6 oz. respectively, in place of 2·2 oz., 2·6 oz., and 1·8 oz., the amounts actually used.

USE OF ARSENICAL GLUCOSE NOT EXPLAINED BY MOTIVES OF ECONOMY.

It is popularly supposed that in using the special make of glucose which has led to such disastrous consequences, the brewers were influenced by economical motives, and it is but fair to them to point out that this was not the case. I believe the price paid for glucose varies from £12 to £9 10s. per ton, and the price actually paid for the glucose which was found to be arsenical was £11 10s. Both English and American glucoses are used, and it is only the latter which can be purchased at the cheapest rate. I found that one of the implicated brewers did use some American glucose, for which he paid £2 per ton less than that which he obtained from Bostock's. Believing the former to be inferior in quality to the latter, he only used it for brewing his low-priced beers, using the more expensive, and, as it turns out, arsenical glucose for his best beers. In another case, a brewer, in order to ascertain which make of glucose would be likely to prove most satisfactory, having regard to the character of the water used in brewing, &c., specially consulted a brewer's chemist on the subject, and it was upon his advice that he decided, in the first instance, to use Bostock's glucose.

WHO IS TO BLAME?

Having regard to the County Analyst's remarks upon the chemical aspect of the question, the Committee will probably be of opinion that either the glucose or the sulphuric acid manufacturer, or both of them, must, to say the least of it, have been guilty of the grossest carelessness. The glucose manufacturer must have known, or should have known, that there are two qualities of sulphuric acid in the market, and that the impure quality is likely to contain arsenic. This being the case, it is but reasonable to suppose that in ordering the acid he would have specified the quality he required, and, considering the purpose for which it was intended, one cannot conceive it possible that he would have ordered the inferior quality. Further than this, knowing, as he should have known, the serious risk involved, it would not have been unreasonable to have expected him to satisfy himself regarding the purity of each batch of acid supplied by having an analysis of it made upon delivery. On the other hand, as regards the manufacturer of the acid, supposing that the order specified the pure quality, in supplying the impure acid either a serious fraud was perpetrated or some one must have been guilty of the grossest carelessness. But even supposing that the quality required was not specified in the order, and the acid manufacturer had been in the habit of supplying Messrs. Bostock and Co., it is hardly conceivable that he could have been ignorant of the purpose for which the acid was intended, and, that being the case, he might at least have made inquiry as to which quality was wanted before executing the order.

In concluding this report I venture to predict that when, in accordance with the policy of the Committee, further samples of beer will shortly be collected for analysis, the new brews will be found to be free from arsenic.

REFUSE DISPOSAL IN THE TWENTIETH CENTURY.

The disposal of refuse in the twentieth century forms the subject of an admirable article written by Mr. G. Watson, A.M.I.C.E., M.I.M.E., which appears in a recent issue of the *Electrical Review*. In view of the interest which our readers take in this important question, we feel sure our contemporary will pardon us for reproducing the greater portion of the article in our columns. After a brief introduction Mr. Watson goes on to say:—

A refuse destructor properly designed and constructed is at present the only known means of disposal which satisfies both sanitary and economical requirements. Like most other improvements, it has been a long time on the way, but certainly the years from 1875, when such furnaces first began to be used, to the present time have not been wasted. They can now be made to work with perfect satisfaction in crowded neighbourhoods, completely surrounded by dwelling-houses, and they can be adapted for use on a large scale in big towns and cities, or on a small scale for villages, hospitals, and even hotels. They satisfy sanitary requirements by reducing town refuse to a hard innocuous clinker, with a proportion of ashes, without emitting from the chimney shaft any nuisance in the shape of stink, smoke, or dust. The stink and smoke are cured by maintaining the temperature within the furnaces themselves at from 1500 deg. to 2000 deg. Fah. The fine dust which used to be distributed from the chimneys of destructors working under strong natural draught was frequently mistaken for smoke, and there can be no doubt that it caused considerable nuisance. The early efforts to reduce it generally took the form of the provision of flues slightly enlarged, and provided with baffle walls, upon which the dust was supposed to strike, and so settle on the bottom of the flue. More logical designs were based upon the principle of making the flues very large, so that the velocity of the gases might be insufficient to carry the dust along, which was thus supposed to be deposited on the bottom of the flues. This arrangement was, of course, fatal to any chance of properly utilising the heat of combustion, owing to the expansion and cooling of the gases in these huge flues.

The stinks, which were undoubtedly caused by the working of early destructors, were due mainly to the use of natural draught, which drew such huge quantities of cold air through the furnaces every time they were either charged or clinkered as to keep them constantly at a low temperature. The stinks were to a great extent destroyed by means of Mr. Jones' "fume cremator," whenever that appliance was worked regularly with an abundance of fuel. This fume cremator consisted of a grate, with suitable rings of fire-brick above it, placed in the main flue between the furnaces and the boilers—when there were any. The cost of working was, however, so high that in most cases the cremator was only worked intermittently, or allowed to go entirely out of use, so that the full benefit of

it was seldom realised. The only types of destructor which may be said to prevail at the present time are designed to work at a high temperature under artificial draught, forced either by means of steam jets or fans, and in the furnaces with which the author is particularly connected the further precaution is taken that all the gases arising from the refuse drying, when it is first put into the furnaces, have to pass over the hottest part of the fire before they can escape to the chimney, while the products of combustion of all the furnaces in a battery are well mixed in a moderate-sized main flue (in which the brickwork is constantly at a glowing red heat) before they are passed into contact with the heating surfaces of the boilers.

To catch the dust the author has devised a large circular swirling chamber, in which the dust is separated by centrifugal force, in much the same way as cream is separated from milk in a centrifugal cream separator. Thus the escape of fine dust from the chimney is prevented. Destructors now satisfy economical conditions by the saving of cartage, the saving of labour, and the full use of the residuals. As regards the saving of cartage, this is effected by placing the destructors in the centre of the population area, and this course is now fearlessly advocated in all cases. The size of installation to be adopted depends, of course, largely upon the manner in which the heat is to be utilised, as well as upon the question of cartage; but it is noteworthy that the city of Hamburg is now destroying half of its refuse, amounting to about 250 tons a day, in the largest destructor in the world, consisting of 36 cells in one house. No doubt such a complete concentration involves extra cartage, but it saves expense in management and contributes to efficiency.

Saving of labour is probably the most important question in connection with destructors at the present time. The amount of labour required at different destructors varies in a most astonishing way. It is certain, however, that it ought not to exceed 7d. for every cubic yard of refuse destroyed in any district in the United Kingdom, and that where it does exceed that figure something is wrong. Seeing that, unfortunately, the cost of burning is usually stated in tons, irrespective of the number of cubic yards that go to a ton, and also of the percentage of moisture contained, it may be well to state that the refuse of London measures about two cubic yards to the ton, whereas in the North of England the muck does not exceed 1½ cubic yards to the ton.

The Strand Board of Works (now incorporated in the City of Westminster) has recently installed a large destructor, in which the refuse is tipped directly out of the collecting carts into the furnaces. The results of this arrangement have yet to be fully ascertained, but it is hoped that some pence per ton will be saved in the cost of feeding the furnaces, and a great sanitary improvement effected by making unnecessary the handling of the muck.

The use of the residuals is not less important than the saving of labour and cartage, and the twentieth century will utilise all its clinker for making mortar, concrete foot paths, fire-proof floors of concrete, concrete bricks and tiles. It will use all the fine dust caught in the dust-catchers as a basis for disinfecting powder, and all the ashes from the ashpits for plastering work. It will pass all its soldered cans through special furnaces in order to recover the solder, and to clean the thin steel plate from its coating of tin, in order that it may be used as scrap steel in steel works, and also in certain chemical manufactures. Most important of all, it will utilise in full the heat made by the combustion of the refuse, for raising steam, to be converted into light and power.

In the case of large destructors for big towns the power will generally be utilised in combined power plants for electric lighting, electric tramways, and electric power distribution; and in small villages the heat will be used to generate steam for driving stone breakers, chaff cutters, fans for smiths' forges, and other such tackle as is generally to be found in a town yard; and, in addition, for grinding mortar from the clinker, treating the clinker in breaking and sizing machinery for concrete purposes, and also in some cases for driving flag presses for making paving slabs, and brick machines for making bricks.

The Corporation of Bradford, the municipality of Hamburg, and the Vestry of St. Luke's, London (now part of the metropolitan borough of Clerkenwell), have probably up to now made the greatest advance in the matter of utilising the clinker. In all three of these cases the whole of the clinker is utilised for the above-mentioned purposes. In the case of St. Luke's very large orders for clinker have been received for the purpose of making concrete floors in warehouses. In Bradford a very brisk sale of mortar takes place, and also of broken and sized clinker for concrete purposes, and of ashes for plastering. Concrete paving slabs are also manufactured on a large scale. In Hamburg the clinker is used mainly for concrete purposes, and that it is appreciated is shown by the fact that no less than 125 tons of clinker are sold, or used by the town itself per diem. It may be remarked that the refuse of Hamburg contains 50 per cent. of incombustible matter. When the author was at the works about the middle of December last, there was not a cart load of clinker remaining on the premises, and it was being fetched away as fast as it could be produced.

Another very important question bearing on the economical result is that of the life of the furnace. The bill for repairs and renewals of a destructor may easily mount up to a most disastrous figure unless it be constructed in the first instance with the most suitable materials, and with all the skill and care which experience alone can furnish. The capital outlay to satisfy such requirements is large, but not so large as that required to rebuild the furnaces at frequent intervals. The day of cheap destructors is past. They must now be constructed so that the furnaces can be worked day and night, with the minimum of interruption for repairs for at least five years. Some engineers are advocating stand-by plants, requiring double the space and double the capital outlay that ought to be necessary. Such expedients are quite needless, in the author's opinion, if the furnaces are built according to the best modern practice; but the question of the life of the furnace will always remain one of the very first importance.

The most important by-product of the destructor—that is, the waste heat—yet remains to be discussed. Probably no question has been much more hotly debated than this. On the one hand, we have figures put forward by persons (of whom the author himself may be considered a type) too much interested to escape the suspicion of some people that he is too sanguine as to results. On the other hand, we have "cold water" poured in gallons by persons who are *not* sufficiently interested in the question to ascertain the facts.

This is not a subject which can be dealt with in general terms, and it would be just as unreasonable to say that, universally, you can obtain so many pounds of steam at a given pressure for so much refuse burned, as to say that you could get so many pounds of steam per pound of coal without stating whether the coal is "Best Welsh" or cheapest "Smudge." The fact is that town refuse varies far more in different towns than does coal in different collieries. It will, however, be safe to generalise to this extent, that in all districts in the neighbourhood of coalfields, from 1 lb. to 1¼ lb. of steam may be counted upon as available for external use for every pound of refuse burned in an efficient destructor, and that in residential districts, remote from

cheap coal, from ¾ lb. to 1 lb. of steam may be counted upon with equal certainty.

These generalisations are sufficiently correct for preliminary purposes, but it will be well for any engineer who has to give reports to study the question particularly upon the spot. The author knows of a seaside town which subsists upon summer visitors, where from the beginning of May to the end of September hardly a ton of coal is burned in domestic grates, gas fires being almost universal for cooking and warming. In the same town small gardens abound, and they contribute to the destructor an enormous quantity of vegetable refuse, which requires a lot of work to put it into the furnaces, and fills a lot of space when it gets there, contributing very little to the resultant heat. There are in the town in question very large numbers of combined privies and ashpits from which wet nightsoil, amounting to about 40 per cent. of the total refuse, is collected. It can, therefore, be readily imagined that the working of the destructor in summer, to give complete satisfaction to all concerned, is no easy matter, without having any regard to steam-raising. In the winter, on the other hand, the refuse contains large quantities of cinders, the garden refuse is largely absent, and the results are proportionately better. In view of such instances as this, it seems hardly necessary to warn electrical engineers and others against any person who comes to them with a general guarantee of so many pounds of steam per pound of refuse, before the guarantor even knows in what district the apparatus is to be installed. It is a fact worthy of note that efficiency is generally in inverse proportion to the size of the guarantee. After making the necessary reservations, it may safely be prophesied that the twentieth century will see destructors and power plants combined in almost every instance where the number of destructor cells exceed four. The destructor will cease to be regarded as an undesirable neighbour or a poor relation, and will be looked upon in its true light as a means of improving the balance-sheet of the power plant. In support of this, readers may be referred to what has been accomplished in the way of steam-raising at Oldham, Shoreditch, Darwen, Hereford, Bradford, Norwich, Fulham, and Beckenham, and many other towns where up-to-date combined plants are either in course of construction or commencing to work with the most promising results. The period of doubt and exaggeration, of controversy and failure, of absurd guarantees and poor performances, is passed; and refuse destructors have now entered the period of sober, useful performance. No one desires more than the author that the results should be recorded with strict accuracy and published with despatch and regularity, as fully and as fairly as the accounts of the electric light undertakings throughout the country. When this is done the twentieth century will be in a position to know what is the lowest cost at which it can be rid of its town refuse, after allowing fully for the value of the residual products, of which steam power will prove to be by far the most important.

Registration of Plumbers.—On Wednesday, the 23rd inst., a deputation of members of the Parliamentary Committee of the Irish Trades Congress waited upon the Right Honourable George Wyndham, Chief Secretary for Ireland, in Dublin, to urge his support of the aims of the Congress, including the Registration of Plumbers under statutory powers. In the course of a sympathetic reply, Mr. Wyndham expressed his sense of the importance of plumbers' work, and his opinion that a number of deaths and a great deal of disease were attributable to defective sanitation and to bad work by incompetent plumbers.

Local Government Board Reports.

The Sanitary Administration of Farnworth and Kearsley Urban Districts.

A heavy infantile death-rate, with inadequate explanations of the same by the local Medical Officers of Health, caused the Local Government Board to send down Dr. W. W. E. Fletcher to these places last March to inquire into the condition of sanitary affairs. His report has just been published. Dr. Fletcher describes in detail the sanitary administration of the Farnworth and Kearsley Urban Districts, which comprise the sub-registration district, and in both cases draws attention to several matters where he considers arrangements made by the Local Authorities to be unsatisfactory. The report also includes returns of the number of deaths from enteric fever of persons belonging to the sub-district from 1896 to 1899, and the number of notified cases of enteric fever in the two urban districts for the same period. In the Farnworth urban district it appears that enteric fever has each year since shown excessive endemic prevalence, although in none of these years has the incidence attained unmistakeable epidemic proportions. Even in 1899, when the attack-rate was greatest, there was sustained prevalence of the disease throughout the year rather than any pronounced epidemic. The large proportions of enteric fever patients who were removed to hospital is noteworthy, and Dr. Fletcher considers it aided in preventing the disease from assuming epidemic proportions.

After detailing the observations made during his visit, and making several comments on the administrative work of the districts, Dr. Fletcher, concludes:—

There has been heavy mortality from diarrhœa in the Farnworth registration sub-district during 1899, especially in the third quarter, when 72 deaths occurred, the deaths in the corresponding quarters of the three preceding years having numbered, in chronological order, 26, 60, and 58. The mortality of infants under one year per 1000 births in Farnworth urban district for 1899 amounted to 259, as against 163 for England and Wales for the same period. In Kearsley urban district it amounted to 186. It may be stated that, owing to mothers working at mills, many young children are put out to nurse during the day; consequently they are likely to be less well cared for than they would be if nursed and fed by their mothers. There is, too, the possibility of soothing syrups, &c., containing opium or other dangerous drugs, being administered to keep the children quiet; and there is, perhaps, also the additional risk of exposure of tender infants to the early morning air, and again to the night air when being taken to and from their day-nurses' residences by the mothers. Much of this heavy mortality was due to infantile diarrhœa, which is especially apt to prevail during the autumnal months. Heavy "infantile mortality" rates are generally associated with districts in which the women go out to work, and in which, consequently, young children are put out daily to nurse. This practice is far more prevalent in Farnworth than in Kearsley, and the difference in the rates for the two districts is very marked. Autumnal diarrhœa, as is well known, must be in large measure determined by improper feeding of infants. Thus not only are feeding bottles and their tubes apt to be imperfectly cleansed, if not actually neglected, but the milk may, on occasions, be of poor quality, or too much diluted, or even sour; almost

invariably it is unboiled. Very frequently, if not usually, starchy food such as bread, biscuits, &c., which are indigestible by young infants, are administered. By such improper feeding the infant is predisposed to attack by "zymotic diarrhœa;" or, as a direct result of improper food, stomachic and intestinal irritation is set up, frequently followed by acute gastritis and enteritis, characterised by sickness and diarrhœa, and death often ensues. Causes of diarrhœa, such as these, are rendered more active in hot weather, since this is more favourable to development and activity of the specific organism of diarrhœa, and also to rapid changes in food-stuffs, especially milk, which are liable to decomposition. But there are also other causes which exert a powerful influence on the prevalence of autumnal diarrhœa, and greatly encourage its local incidence and persistence. Chief among these are unwholesome circumstances, and especially such as are associated with pollution of the air and soil by decomposing animal and vegetable substances, and, among such, the foremost rank must be given to excremental material. These unwholesome conditions, moreover, are precisely those which encourage also the development, prevalence, and persistency of enteric fever. They have been shown to exist extensively throughout both the districts under consideration, and have undoubtedly had a large share in inducing diarrhœa, and in developing from infected material outbreaks of enteric fever, and in fostering the disease in an endemic form in the locality. If the District Councils continue to permit the existing unwholesome conditions, the districts will probably suffer a penalty similar to those experienced in other places where like conditions have not been removed; the endemic disease may assume epidemic proportions with a correspondingly enhanced mortality. A serious responsibility rests upon these Councils, and they should see to it that they do not become answerable, collectively as Councils, and individually as Councillors entrusted with the care of the health of the inhabitants of their districts, for a prolongation of the unsatisfactory state of things now existing, with its concurrent risks and possibilities.

MR. COSHAM'S SEWAGE SYSTEM.

SUCCESSES IN THE DURHAM DISTRICT.

Last week several members of the Brandon District Council, Durham, met at the recently-erected sewerage tanks at Langley Moor, when the sewage was turned into the tanks for the first time for treatment. Mr. Cosham, the patentee of the precipitating tanks in question, was in attendance to explain the working of the same. After spending some time in the examination of the works in detail, the company adjourned to the Langley Grand Hotel at the invitation of Mr. Cosham, where an excellent repast was partaken of.

The Chairman said it afforded him great pleasure to meet Mr. Cosham, the members of the Council, and other gentlemen, on the completion of the tanks for the disposal of the sewage of Langley Moor. He trusted that the tanks would come up to the expectations that were formed of them. They already had two or three in different parts of the township, and might perhaps require more. He was glad that Mr. Cosham was present on the occasion to enlighten them on the system of sewage disposal which he had patented. With these few remarks he proposed "Success to the sewerage tanks."

Mr. Cosham said it afforded him very great pleasure to meet the members of the Council and other gentlemen on that occasion. Had this been the first tank that had been erected the members might have felt a little diffident as to whether they were going to be a success or not, but as this was the third installation the Council had put down they might be expected to know something about the system. He would endeavour to enlighten them as to the value of these tanks. Mr. Gregson, of Durham, was the first gentleman to introduce the system to this neighbourhood, having witnessed the installation at Nuneaton, where about 500,000 gallons of sewage were disposed of daily. Now systems for the disposal of sewage were about as numerous as quack pills, much advertised, and each professing to be the only satisfactory system in existence. It was very hard work, then, to get any Authority to adopt his system, but at last he was successful at Nuneaton, and so satisfactorily did the system work there that other Authorities gradually adopted them. Mr. Snowdon, the surveyor to the Sedgefield District Council, wrote him a very flattering testimonial to the effect that the tanks gave most satisfactory results, so much so that his Authority had decided to deal with other places in the district by the same method. The system of sewage treatment consists in precipitating the solids by chemicals. The sewage on reaching the outfall works passes through a screening chamber, so constructed as to thoroughly break up the solid matters and reduce them to a state of suspension fit for subsequent treatment and removal. It then flows through the chemical cage, constructed so as to accurately regulate the quantity of cake consumed to the flow of sewage. The sewage is then conveyed by a pipe discharging into the central portion of the tank, and after passing through a series of divisional chambers, is finally taken to the natural filtration beds or land. The sludge is extracted automatically, and finds its way by gravitation into sludge beds. The chemical used was alumino-ferric, the expenditure on which was very small indeed. In conclusion, he maintained that by adopting his system a very great saving would accrue to the ratepayers. He had put fifty different installations of his system down in various parts of the country, and had not had a complaint yet. He suggested that the Surveyor and Medical Officer should experiment upon the tanks for a short time, using one to be treated by the bacterial process, and the other by precipitating the sewage by chemicals, and they would soon be convinced that the latter was by far the better method of treatment. In conclusion, he considered that the District Council were justly entitled to the admiration of the ratepayers of the district for introducing a system which had proved in other places to work with both efficiency and economy.

On the motion of Mr. Barnes, seconded by Mr. Pearson, a cordial vote of thanks was accorded to Mr. Cosham for his interesting and instructive address.

The town of Langley Moor is of about 4000 inhabitants. The works consist of two circular tanks, the cost of which, including charges for patent rights and fittings, only amounted to the sum of £500. This works out at the cost of only 2s. 6d. per head of the population. The labour required on the works will be one labourer one day per week, and the cost of chemicals will not exceed 5s. per week. The £500 does not, of course, include the cost of sewers and land.

Small-pox continues to increase in Glasgow rather alarmingly. Up to Wednesday in last week, the total under treatment — excluding dismissals—was 202. Fortunately the disease continues to be of a mild type. Considerable reluctance to be re-vaccinated has been shown, even by the inmates of houses where the disease has broken out, but a more intelligent feeling is beginning to evidence itself. Arrangements are being made to establish a number of re-vaccinating stations in the city.

HEREDITY AS A FACTOR IN THE CAUSATION OF TUBERCULOSIS.

In recent years there has been a marked change in the opinion of medical men in regard to heredity as a factor in the causation of tuberculosis. Speaking from the present point of view, says the *Sanitary Inspector* (official bulletin of the State Board of Health, Maine, U.S.A.), we may say that pre-natal infection is rare, and that true heredity almost never occurs. The truth of this is indicated by the present position of most of the leading medical authors and teachers; by the results of recent statistical studies of tuberculosis, in which the errors in the earlier studies have been eliminated; by the records in the hospitals for children and in foundling and orphan asylums; by the studies in pathological institutes; by observations among animals artificially infected; and by the observation of the veterinarians.

Cornet, making a careful study of the whole tuberculosis mortality of Prussia covering a period of sixteen years, shows that the mortality curve is higher during the first year of life than at any time until the twentieth year is past. The high death-rate during the first year of life, according to this eminent authority on tuberculosis, is not an indication of heredity, but is due to the more intimate association with tuberculous mothers during the first year and the rapid prolification of tubercular lesions which follows infection in the earlier weeks or months of infancy.

The observations of Heubner in his Berlin clinic confirm those of Cornet, but he shows that during the first three months of life tuberculosis is a rarity, to say the least. In his clinic during the last five years, as he stated last year, there were :—

Children.	Ages.	Tuberculous. Per cent.
844	3 months or under	None.
218	3-6 months	3·6
93	6-9 ,,	11·8
75	9-12 ,,	26·6
458	second year	14·2
367	third ,,	13·4
306	fourth ,,	11·1
470	fifth-sixth ,,	7·4
682	seventh-tenth ,,	5·0

Thus with Cornet he finds a large prevalence of tuberculosis during the first year, but he found no tuberculous children during the first three months of life. In experiments upon animals, says Heubner, we know that the time which elapses after the inoculation of the bacillus of tuberculosis before gross pathologic changes of the internal glands take place is from two to three months. Now, new-born children in general remain free from visible signs of tuberculosis just these three months. No more striking proof could be presented that the tuberculosis of young children is acquired, and not brought with them into their post-natal life.

The experience of Boltz is like that of Heubner; no cases of tuberculosis under the fourth month. In the Berlin Pathological Institute this rich field of observation disclosed no case of tuberculosis in children under two months, and only two under three months of age, and Dr. Virchow, the eminent director of the Institute, declares :—"I deny emphatically the heredity of tuberculosis."

We may say that in the absence of chances of infection after birth tuberculosis rarely occurs. The truth of this is attested by many observations in medical circles. Those of Bernheim of Paris are interesting, particularly his three histories of twins born while the mothers were tuberculous.

"In each instance one of the children was reared in its own home, being nourished by a healthy wet-nurse, while the other child was sent from its home and reared in the country. The three children which remained at home died; one of consumption, the two others from tuberculous meningitis. Two of the nurses also died of tuberculosis. On the other hand, the three children which were removed from their homes and reared in the country under healthful hygienic conditions are all still living and well."

The experience of the veterinarians in Denmark in recent years in separating calves from their tuberculous dams is equally convincing that the influence of heredity has been very greatly overrated.

Sanitary Inspectors' Associations.

South Wales and Monmouthshire.

The fourth annual meeting of the Association was held at the District Council offices, Aberdare, on Saturday, the 26th of January, 1901.

A Council meeting was held in the forenoon, Mr. D. Vaughan and Mr. J. Preece James, the newly-elected chairmen, presiding. Mr. J. Preece James (Tenby) was elected chairman for the ensuing year, and Mr. John T. Owen (Merthyr) and Mr. James P. Jones (Gelligaer) vice-chairmen; Mr. W. Lloyd-Marks (Rhymney) was elected treasurer.

Subsequently the annual meeting was held, presided over by the president of the Association, Dr. W. Williams, Medical Officer of Health, Glamorgan County Council. There were also present: Dr. W. Ll. Rhys, Deputy Medical Officer of Health, Aberdare; Colonel Thomas Phillips, solicitor, Clerk to the Aberdare Urban District Council; Messrs. D. Vaughan; J. Preece James; James P. Jones; John T. Owen; W. Williams; T. W. Warren; Spencer E. Jones; and the hon. secretary, Mr. J. Towy-Thomas, together with representatives from Aberdare, Merthyr, Hengoed, Cefn, Tenby, Cardiff, Swansea, Blaina, Monmouth, Rhondda, Newport, Gowerton, Barry, Ferndale, Pentre, Tonypandy, Treherbert, &c. &c. The following gentlemen were elected to honorary membership :—Dr. C. E. G. Simons, M.O.H. (Merthyr), Dr. J. Pugh Jones (Ynyshir), Mr. W. D. Morgan (Architect and Surveyor, Pentre). Messrs. Thomas Bowen (Pontypridd), S. John James (Login), R. J. Davies (Hengoed), D. J. Jones (Pontypridd), J. W. Jones (Swansea), and David B. Phillips (Cardigan) were elected members.

The Hon. Secretary presented the Council's annual report, which showed steady progress and a vigorous determination to push forward the cause of the Sanitary Inspector. It was adopted with acclamation.

The Treasurer presented his statement of accounts, which showed a substantial profit on the working of the year.

Mr. W. J. Hopkins, Chief Port Sanitary Inspector, Barry, was re-elected librarian; Mr. J. P. Jones and Mr. T. W. Warren were re-elected auditors; and Mr. George Thomas and Mr. W. Williams elected scrutineers.

Mr. Samuel James, C.S.I., Chief Sanitary Inspector, Aberdare, read a most instructive and practical paper on "House-to-house Inspection," which evoked considerable discussion.

At the close of the meeting the members adjourned to the Boot Hotel, where they were entertained to luncheon by Colonel Thomas Phillips, who was enthusiastically thanked for this unexpected appreciation he had bestowed upon the members.

Notwithstanding the inclemency of the weather, the meeting was a grand success.

National Health Society.

OFFICIAL TRANSACTIONS.

Training courses for the Sanitary Inspectors' Examination Board Certificate and for the Diploma of the National Health Society.—Syllabus of lectures and demonstrations on "Public and Private Hygiene," by John Gay, M.R.C.S., L.R.C.P., D.P.H. Tuesdays and Fridays, at 3.30 p.m., at 53, Berners-street.

LECTURE I.—Air. Composition of Atmosphere—Atmospheric Conditions affecting Health—Meteorological Observations—Sources of Vitiation of the Atmosphere.

,, II.—Air (continued). Effect of Vitiated Air on Health—Overcrowding—Back-to-back Houses—Natural and Artificial Means of Ventilation—Warming—Lighting.

,, III.—Water. Sources of Water—Drinking Water—Sources of Pollution of Drinking Water—Methods of Prevention.

,, IV.—Water. Collection, Distribution, and Storage—Constant and Intermittent Supplies—Lead in Drinking Water—Hard and Soft Water—Water-borne Disease—Filtration and Filters.

,, V.—The Habitation. Characters of Various Soils—Pollution of Soils—Ground Air and Subsoil Water, their Effects on Health—Aspect, Site, Foundations, Walls—Damp, Cause and Prevention, Effect on Health — Dwelling-houses, Schools, Hospitals.

,, VI.—House Drainage. Drainage in Town and Country — Water Carriage System — Faulty and Correct Arrangement of Drainage—Traps—Joints—Fall—Disconnection—Ventilation of Drains—Testing.

,, VII.—Demonstration at the Parkes Museum.

,, VIII.—House Drainage. Conservancy System—Cesspools — Middens — Privies — Pail Systems — Dry-earth System — Sewage Disposal — House Refuse, Collection and Removal — Refuse Destruction — Scavenging.

,, IX.—Demonstration.

,, X.—Demonstration.

,, XI.—The Calculation of Areas and Cubic Space.

,, XII.—Demonstration.

,, XIII.—The Laws of Health. The Functions of the Body—Cleanliness and Filth—Filth and Disease—The Hygiene of the Skin—Clothing—Bedding—Hygiene of Different Periods of Life—Infancy, Childhood, Age—Exercise.

,, XIV.—Diet. Classification of Foodstuffs—Values of Foods—Preserved Foods—Diet for Work, for Sustenance, and for Disease—Diet for Infants—Vegetarianism—Beverages—Alcohol.

Demonstrations at the Parkes Museum and of sanitary and insanitary areas, &c., will be notified during the course of the lectures, which will be detailed and fully illustrated by models, diagrams, and experiments.

THE first lecture on "Nursing" was given on Thursday last, and the course will be continued on the five following Thursdays.

ON Monday (January 28th), Dr. Cantlie gave his first lecture on "First Aid." The lecture was well attended, but there are still vacancies for more ladies in the class.

THERE are still a number of copies of the N.H.S. almanacks for 1901 to be obtained, and these will be sent to the Society's lecturers for free distribution amongst their classes, on application to the Secretary at the office, 53, Berners-street.

PRESENTATION.

ON Thursday evening, January 24th, 1901, at the Council offices, Pentre, Rhondda, Dr. Herbert Jones, Medical Officer of Health, and Mrs. Jones, were the recipients of valuable presents upon their leaving the district for Hereford, where Dr. Jones has been appointed to a more lucrative appointment.

Mr. W. J. Jones, Engineer and Surveyor to the Rhondda Council, presided, and was supported by Councillor M. Morris, J.P., Chairman of the Rhondda Council; Alderman Walter H. Morgan, Clerk; Dr. T. W. Parry, Dr. W. E. Thomas, Dr. E. N. Davies, Dr. Ivor H. Davies, Dr. T. H. Morris, Mr. James Miles, National Collieries; Mr. Evan Llewellyn, Mr. Octavius Thomas, &c.

Dr. Herbert Jones was presented with an old oak pedestal desk, exquisitely carved, with nest of drawers, and chair to match. The presentation was made by Councillor M. Morris. Mrs. Walter H. Morgan made a presentation to Mrs. Herbert Jones of a silver tea service and tray. Dr. T. N. Parry made a joint presentation to Dr. and Mrs. Herbert Jones of a beautiful case of knives and forks, spoons, &c. Mr. J. Towy-Thomas, Chief Sanitary Inspector, Rhondda, on behalf of himself and colleagues, presented Dr. Jones with a fine photo group of the Rhondda Sanitary Staff, Dr. Herbert Jones being the central figure.

In addition to the above speakers who made the presentation, speeches were delivered by Alderman Walter H. Morgan, Mr. James Miles, and Dr. T. H. Morris, C.C. Light refreshments were supplied, and a most enjoyable evening was spent. Dr. Herbert Jones takes with him the good wishes of the thousands in the teeming Rhonddas. This is much to say when we take into consideration that the Rhondda Council is the largest Urban District in the United Kingdom.

The appropriate lines read by Mr. Towy-Thomas verily touched the audience; his closing lines were:—

> The words unsaid, the things undone,
> Must go, we say farewell;
> Prosperity roll on, roll on,
> The mutual tale to tell.

CORRESPONDENCE.

(We do not in any way hold ourselves responsible for opinions expressed by our correspondents.)

(To the Editor of THE SANITARY RECORD.)

BOER BULLETS—ARE THEY POISONED?

SIR,—I have recently examined some bullets which were supposed to be poisoned, and I found that they were coated with paraffin wax, tinted a pale green with a salt of copper. There was no other poison present, organic or inorganic. It cannot in any practical sense be called a poisoned bullet. The bullets were genuine, and were picked up on Harts Hill after the battle of Colenso. They have the appearance of having been dipped into a bath of melted paraffin which had become green from frequent contact with the edge of the copper cartridges. The copper may, however, have been purposely added in order that the Boer rifleman should believe he had a more than ordinarily deadly weapon in his hand.

—Yours faithfully, ARTHUR ANGELL,
Southampton. *Public Analyst.*
January 17th.

NOTICES.

ANNUAL SUBSCRIPTIONS.—The Annual Subscription to "THE SANITARY RECORD," for the United Kingdom, paid in advance, is 12s. 6d. For the Colonies and Abroad, 15s This includes postage, and a Copy of the Diary, post free.

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The Sanitary Record
AND
Journal of Sanitary and Municipal Engineering.

JANUARY 31, 1901.

THE HOSPITALS COMMISSION REPORT.

THE Report of the South African Hospitals Commission, which was issued last week, is in its general tenor much what we had been led to expect, and may be considered by the public to be eminently satisfactory. The fears that have been entertained by some persons that it would not be thoroughly impartial, or that it would whitewash the authorities, may be at once discarded. There is not a vestige of such a thing in the Report. Praise and blame are dispensed with even-handed impartiality, where they are deemed to be due—and it is satisfactory to know that the praise predominates. So far as organisation was concerned, the Commissioners, it is true, point out many defects, some of them due to the same causes as have contributed to the difficulties and protractedness of the war as a whole, others to the ordinary constitution of the Royal Army Medical Corps. The heads of the Army Medical Department no more foresaw the magnitude or duration of the war, and the vast difficulties that would have to be contended with, than did the general military authorities; and for that it is difficult to blame them, for the whole nation was taken by surprise. It is fair to say that these things could hardly have been foreseen. But the Commissioners are at pains to point out that even had the difficulties been foreseen, the Army Medical Corps would have been unprepared, and from its constitution was ill-fitted to meet them. They state that not only was it wholly insufficient in staff and equipment for such a war, but "it was not so constituted as to have means provided by which its staff could be very materially enlarged or its deficiencies promptly made good." For that they hold that the Director-General and his staff cannot be blamed, for "they had for a considerable time before the outbreak urged upon the military authorities for an increase of the corps, but for the most part without avail." The War-office is thus put upon its defence, and their responsibility in this connection will no doubt be debated in Parliament. The reorganisation of the Army Medical Department, so as to render it capable of meeting any possible demand in the future, must form part of the whole scheme of Army Reform, which is to engage the attention of the Parliament about to meet. The public can now realise not only the urgency, but also the magnitude of the reform that is necessary. But it is satisfactory to us to learn that for any shortcomings the medical authorities cannot justly be held responsible. With regard to the mode in which the Medical Corps discharged their duties, the Commissioners remark that, like every large body, it has its unfit or bad members, but the proportion of bad members was very small, and speaking of the officers as a whole, their conduct and capacity deserved great praise.

There is a word of blame for the Surgeon-General in South Africa for having apparently failed to fill up the blanks left in consequence of the withdrawal of field hospitals from units already organised. But considering the whole situation, the enormous difficulties of transport and the like, and the military necessities of the campaign, the Commissioners consider that the principal Medical Officer and his head staff did excellent work, never sparing themselves, and showing every desire to provide for the comfort of the sick and wounded. All requisitions from South Africa were promptly met by the home authorities, and their efforts were ably supported by the authorities at the base in South Africa. Taking into account the inevitable difficulties, the Commissioners were well

satisfied with the way in which the railway authorities, both civil and military, discharged their duties in connection with the transport. And the hospitals they found at the time of this visit to be in excellent condition, and well supplied both with staff and equipment, and the sick and wounded were very well attended to. That disposes of the greater part of the fabric of charges raised by Mr. Burdett Coutts and his fellow alarmists. Still, the Report indicates that there are large fields in which improvement is necessary, and it contains many important suggestions for remedies, which will, no doubt, receive due consideration. But the concluding passage of the Report must be peculiarly gratifying to all who are sensitive about the national honour. "We desire to say that, in our judgment, reviewing the campaign as a whole, it has not been one where it can properly be said that the medical and hospital arrangements have broken down. There has been nothing in the nature of a scandal with regard to the care of the sick and wounded; no general or widespread neglect of the patients, or indifference to their suffering; and all witnesses of experience in other wars are practically unanimous in the view that, taking it all in all, in no campaign have the sick and wounded been so well looked after as they have been in this."

The Plumbers' Registration Movement.

Various meetings of the plumbing trade are at present being held in different centres, with a view to carrying out one of the most important resolutions adopted at the Birmingham Conference held on October 24th last, viz., that for the establishment of two grades of registration, one for operative plumbers and the other for master plumbers, Inspectors, and plumbers occupying similar positions; and also for recognising as eligible for registration in the operative grade all operative plumbers who have already passed the requisite examination in workmanship, or who may produce proof satisfactory to the Registration Committees of the respective districts that they have been earning the standard rate of wages in the districts in which they work. The facilities for registration for the class of operatives last mentioned are to be limited to those who apply not later than February 28th, 1901. At a meeting recently held in Glasgow, Dr. John C. McVail, Medical Officer of Health for Dumbartonshire, likened the present stage in the plumbers' registration movement to the one through which Medical Officers had passed. He pointed out that at first practitioners were appointed who had no special health diploma, then voluntary effort came in to provide such diplomas, and public Authorities came more and more to regard them as essential qualifications; and finally the possession of a public health diploma was made imperative by statute. And, as in the case of many men who were established in practice before the Medical Act was passed, and to whom, with wives and families dependent on them, it would have been a hardship to be deprived of the advantages of a registered qualification, entrance was given within a fixed time; so on the same principle, and in accordance with usage, an opportunity was now to be given to men who were known to be good practical plumbers to get upon the list. There can be little doubt that sooner or later the present voluntary system of registration will develop into one in which it will be imperative for a man to be registered in order to be recognised as a qualified plumber. In order to encourage operatives to take advantage of the present opportunity, it has been decided to reduce the entrance fee, and it is earnestly hoped that the trade will make a hearty response. The Plumbers' Registration Bill is to be vigorously prosecuted in the coming session of Parliament—with what prospect of a successful issue it would be unsafe to predict.

A Scottish Sanatorium.

Some interesting details are given by a correspondent in a Scottish paper of the new consumptive sanatorium just completed at Banchory, on the Middle Deeside. This is the first establishment in Scotland which has been specially designed and erected on a specially-selected locality for carrying out the Nordrach treatment. Erected at a cost of over £600 per bed, it is claimed for Nordrach on Dee that it is by far the finest of its kind in Britain, and one of the best in Europe. Great care was exercised in the choice of a site, months being spent in scientifically comparing the topographical and climatic conditions that obtain in many different areas. In the case of the German sanatoria, no effort is spared to procure the most desirable atmospheric surroundings, so much importance is attached to the quality of the atmosphere as a factor in the success of the treatment. Hence Middle Deeside has been chosen for its dry, bracing, ozone-laden atmosphere, and the mildness of its winters. The grounds extend to about 25 acres; and the lengths of the walks are graded according to the strength of the patient. Shelters are erected here and there among the trees, some of them being on the revolving principle. The outdoor attractions are to be increased by the provision of a winter garden in the verandah that connects the sanatorium with the dining-room. The sanatorium has accommodation for forty patients, and there are present thirty inmates.

A Compromise Needed.

A paragraph in the *Sussex Daily News* last week indicates one of those unfortunate cases where localities are let in for heavy costs through the exercise of a little obstinacy instead of a more compromising spirit on the part of those in power. According to our contemporary, the drainage proposals of Haywards Heath are still engaging the attention of the parishioners of Lindfield. The impression carried away from the recent inquiry by most impartial people was that the question should be settled by some sort of compromise, and a most conspicuous

feature of the evidence was the want of unity on the Lindfield side. They were unanimous in opposing the Haywards Heath scheme, but apparently were not agreed on an alternative. The Lindfield Parish Council have had a special meeting to consider the question, and have appointed a deputation to wait upon the landowners likely to be affected by the suggestion of Mr. W. Sturdy and his agent, Mr. Millard, that the sewage should be taken on to a site at Noble's farm, with a view to obtaining their favourable consideration. If at all successful, the Parish Council would then endeavour to prevail on the Committee of the Rural District Council to support the proposal and join with the parochial representatives in asking the Haywards Heath Council to accept the compromise. The feeling at Haywards Heath is undoubtedly friendly to Lindfield, and it is only owing to the conformation of the ground that it is proposed to take the sewage into Lindfield. If the Lindfield representatives and the owners concerned agree, and point to a site where Haywards Heath could go on fair terms and without opposition, both districts would be satisfied, and the problem solved without the aid of Parliament. It is quite clear that the Lindfield people have no real grievance, for all unbiassed people agree as to the utility of the Haywards Heath proposals. But there are some people who must object to everything. We do not mind that if they have to pay for their whims. What we object to is their burdening the ratepayer with costs that are wholly unnecessary in order to get their own way.

Hospital Reform.

Much thought and anxiety have been expended in recent years on the hospitals of the metropolis. But somehow or other things do not go quite so well as we should like. Some put the blame in one quarter, and some in another. There must be something wrong somewhere, or else we should not have those periodic spasms of complaint which find their way into the daily Press. It may be, as a writer points out in the *Morning Post*, that the officials are the weak point, and that the lack of courtesy by many of these individuals works against the institutions. At the close of an excellent article, the author says that we of the British race have been "commended for many excellences, but we have never been congratulated on a national courtesy. Doubtless an insular instinct leads us to raise obstacles and barriers in the way of all forms of new enterprise, but it is a national pity when obstacles are placed against a popular entrance into the hospital world. For it is a charming world, and the workers of our institutions are nearly all acting up to a high standard of charity and kindness to the sick under their care, so that they have no cause to shrink from criticism. There should be, and there often is, something very gracious and 'pitifully courteous' about the atmosphere of a hospital. And the officials of such an institution should be the first to copy nature's plan of covering up the dry bones of necessity with comely and attractive externals. From the mere commercial aspect of the case there would be fewer hospitals with the dread of debt hanging over them were the graceful working of the machinery displayed in an organised system of institutional amenities. I could cite one matron who contributes £500 yearly to her hospital from the voluntary offerings of interested visitors whom she takes round the wards. Popularise the hospitals and the public will gladly pay the bills. The routine work is admirably done. But it sets its light under a bushel, and the public often forgets to drop a contribution into the box because the box is kept in the shadow."

Bradford Refuse Disposal.

The thriving town of Bradford in Yorkshire is becoming quite celebrated for its successful municipal projects. Everybody is talking about the wonderful things it is doing, and papers are holding it up as the model of what a spirited municipal government can accomplish. The reason for much of the interest manifested in the work of the place may be traced back to the visit of the British Association last year, when so hearty a Yorkshire welcome was extended to hundreds of visitors from all parts of the United Kingdom. Doubtless the thing that impressed most people was the work accomplished under the direction of Mr. McTaggart, the superintendent of the Cleansing Department. Each week confirms the utility of the refuse disposal works. Our readers will remember that the Corporation clears all the ashpits at regular intervals, taking the refuse to the destructors, where it is passed through the fire, and the clinkers remaining are ground into powder, which in turn is placed into moulds, pressed, and thus producing paving flags ready for use. These have been thoroughly tested, and have proved equal to the best stone. By these and other means, Bradford has reduced the cost of its refuse destruction to less than one-half what is paid by the great majority of districts. No wonder that other Corporations and Councils are sending deputations to inquire "how it is done." It is simply this, that the officers were encouraged to make experiments, and that now the town is reaping the benefit of its enterprise.

Vigilance Committees.

Ratepayers' Associations and Vigilance Committees may be very useful or very harmful bodies. When they exist simply to attack individuals or make petty criticisms they are not of much service, and generally prove themselves to be the last persons to whom the interests of any community may be entrusted with safety. But if they are composed of sincere men they may do much good. Such a one was that which came into existence shortly after the plague had made its appearance in Sydney. The City Council did not appear to realise the enormity of the evil which had invaded its borders, hence many influential citizens banded themselves together to show the Council its duty. Lacking the executive power to carry out thoroughly the work which required to be done, it could only act as an agency

of investigation and supervision; but in this capacity it has rendered invaluable service to the public. The City Council professed to scorn the Vigilance Committee, but there is no doubt whatever that the repeated public exposures it suffered at the hands of the latter body spurred it into taking reluctant action on many occasions. How hard and earnestly the Committee worked is shown by their report. They received and dealt with 1862 complaints regarding 2178 premises which were alleged to be in a rat-infested or insanitary state, besides many hundreds of letters referring to matters within the scope of their activities. Three thousand six hundred and thirty visits of inspection had been made, and 6487 letters had been written to the various Authorities and to the public. How dilatory the responsible officials were is made apparent by some of the results given. "Of the 2178 premises complained of, the Committee received definite information that 1182 had been, or were being, attended to, while 31 were matters between landlord and tenant, with which the Committee could not interfere. Of the rest a few might have been put right since the Inspector's last visit, but the majority still required attention." With the expulsion of the plague some suggested the disbanding of the Committee, but this has not been done. It has simply "adjourned." And if the City Council fails to insist on the carrying out of much-needed reforms, the Vigilance Committee will spring forth once more to compel it to do its duty.

Storage of Petroleum.

Concerning a reply to a query which appeared in our "Notes and Queries" (No. 2051) a correspondent writes :—"I have for a long time been urging that the use of the word 'petroleum' in the Acts is misleading, because it gives one the impression that there are restrictions on the sale and storage of all petroleum, *i.e.*, mineral burning oils. As, of course, you are aware, the Acts only apply to petroleum which flashes at 73 deg. or under. Any oil which flashes at over 73 deg. may be stored and sold absolutely without restriction of any kind, excepting in the case of regulations made by a few local bodies as to hawking. Now, your answer is exactly correct, but I think that some readers might suppose that any petroleum oil would have to be kept divided up into bottles holding a pint or less, which, of course, is not the case. What I think ought to be done would be to call all petroleum under 73 deg. flash point petroleum spirit, and that above petroleum oils." We may add that we are thoroughly in accord with our esteemed correspondent in this matter.

Sandgate "Homes."

We continue to be favoured with correspondence relating to the management of the Jones "Homes" at Sandgate. Some of the letters are couched in terms the reverse of complimentary to Mr. Jones, but a general opinion prevails that the matter is of the utmost importance so far as the welfare of the town is concerned. It appears that there has been a further outbreak of typhoid in one of the houses, supplemented by scarlet fever in another. From a public health point of view it would be interesting to hear what the Medical Officer of Health has to say to the presence of typhoid in a house where there was typhoid last August, and whether this second appearance of the disease within five months of the first does not disturb his optimistic faith, expressed by him to the representative of a London daily paper, that "there is no fault to be found with any of these homes." We have no desire to enter into a controversy on the culinary arrangements of these places, concerning which there are also complaints, but we do think, for its own sake, the little town should stir up its Health Authority to investigate the source of these outbreaks of infectious disease. An isolated statement it can afford to ignore, but statements which bear upon them *primâ facie* evidence of trustworthiness can hardly be so treated. Nor can a journal which is devoted to public health matters pass them by without comment.

MUNICIPAL ENGINEERING & SURVEYING.

CROSS-TABLE CHAT.

I have been asked by a correspondent if I will state my opinion as to the propriety of an engineer or surveyor using the initial letters "C.E." after his name. I am not sure that anything which I can say will be helpful, as the matter is one which must be decided by a man's conscience and taste. It is alleged, I understand, that no person who is not an associate or member of the Institution of Civil Engineers is entitled to the use of such letters. Such an opinion comes, of course, from members of the Institution which has done so much to raise the status of engineers, and which wields such an influence over the profession. The opinion given under such circumstances must, however, be taken as *ex parte*, and naturally enough is not a disinterested one. The Institution of Civil Engineers is not, it should be remembered, the only association of engineers in the kingdom, and until quite recently persons were admitted to associate membership with scant qualifications and without undergoing any examination, and on this account many engineers, to my knowledge, refused to become members. Partly on this account, and also because the numerical strength had grown to such proportions and the finances of the Institution had become so great as to make it practically independent, and mainly because the instinct of self-preservation asserted itself so strongly, that a majority of the members who had safely entered its portals obtained a resolution to close the doors as far as possible to other candidates. The Institution now, with a few exceptions only, admits new members after passing a qualifying examination.

It, of course, follows that the number of new members yearly admitted will be greatly restricted. But the end aimed at has been secured, with much satisfaction. I would, however, point out that the Institution of Civil Engineers is not alone in imposing increased qualification for membership, for the Incorporated Association of Municipal and County Engineers have also imposed, quite recently, new restrictions, so as to prevent persons whose qualifications are doubtful from

becoming members. But it is an improper assumption to say, as it appears is done, that a person who is not a member of the Institution of Civil Engineers is not entitled to the use of the letters "C.E." Many engineers there are who have passed examinations as surveyors under bodies other than that of the Institution in question, and their qualifications are better than those of a large number of existing members who passed no examination whatever, and whose principal qualification was the payment of a substantial entrance fee. I do not, however, hold that any person is entitled to use the letters. He must possess some qualification, which may be evidenced by a considerable and long practice as an engineer and surveyor, or by a *testamur* that he has passed an examination for engineers or surveyors held by some association or body of repute. Under such conditions he is, I think, as much entitled to use the letters as a medical man who has only obtained the qualification "L.R.C.P." is to the term "doctor"—though, to be correct, no medical man is entitled to the appellation unless he has obtained the degree of "M.D."

I am not sure whether it is generally known that Local Authorities who wish to raise money for carrying out some improvement in their district without defraying the cost thereof out of current expenses or without going to the Local Government Board for their approval and sanction for a loan can do so with considerable ease, providing they are possessed of land purchased for the purposes of sewage disposal. I have recently come across a number of instances where Local Authorities have borrowed money on the mortgage of sewage farm land, as they are enabled to do under Section 235 of the Act of 1875, to defray the cost of road improvements, erecting permanent buildings, improving the water supply, &c. The provision is an eminently useful one, especially to the smaller Local Authorities, and it may be put into operation for raising money for any purpose whereon a Local Authority is enabled to borrow money under the Public Health Act.

There are many of my readers whose duty it is to exercise supervision over Lancashire and other forms of boilers used for steam raising purposes, and it will be of interest for them to be acquainted with the best methods for raising steam with the minimum consumption of coal and the minimum manufacture of smoke. It is for this reason that I refer to an excellent mechanical stoker which I recently inspected. This stoker is Ransome and Rapier's mechanical stoker for boilers. Its advantages are that a regular, even, and complete combustion is secured. The coal is automatically distributed over the fire every few seconds and in such a manner that no two successive charges fall in the same place, which ensures a bright fire of uniform thickness and perfect combustion, and consequently little or no perceptible smoke. The mechanism is excellent, and is not liable to rapid deterioration by contact with the furnace, as is the case with some stokers. The firm assure me that since the introduction of the mechanical stoker in question the steam production has been nearly doubled, whilst some firms allege an increase of 75 per cent. I am unable to describe the principles and mechanism in this column, but would advise those who are interested in the subject of the generation of steam and the reduction of smoke to get the required information from the makers, whose London offices are at 39, Victoria-street, Westminster, S.W.

It is a singular and inexplicable circumstance that no Government department is so indifferently conducted, and the ordinary conditions of business management are so utterly neglected, as the War Department. Why common-sense administration and government should be at such a discount is a problem which is unsolvable. I do not refer to any mal-administration during time of war. This is bad enough to be sure, but take as an example a set of conditions which prevail in time of peace, and which conditions are readily understood by a municipal engineer. Whenever the Department requires a contract for the supply of stoneware pipes, the tenders are to be submitted on a specification which is characteristic of unpractical men, *minutiæ* relating to colour, thickness, length, &c., being elaborated with a puerile precision which, as a consequence, increases the price to an extraordinary degree. The usual stock sizes of 4in., 6in., and 9in. pipes, such as are specified by the ordinary or "garden" engineer are despised, but pipes of 5in., 7in., and 10in. only are those which the Royal Engineer in his wisdom will specify. Of course this means a very considerable increase of price, but this is an unimportant detail. During the process of manufacture the War-office has a representative on the premises of the manufacturer whose expenses have to be included in the price of the pipes, and they have also to find him a number of attendants. Each pipe is tested as to thickness, colour, length of pipe and collar, trueness of section internally and externally, resistance to fracture, &c. &c., and if the variation from the specification, be at all discernible the pipes — which being unusable by others than the War Department — are rejected, and have to be broken up for they cannot be sold. The consequences are that the nation has to pay almost 200 per cent. more for this frivolity than is necessary, for the cost of testing alone as carried out is more than the value of the pipes, and on an average about 200 pipes are tested per day, and then these pipes are sent out to the Gold Coast or Jamaica to be laid by natives. It is devoutly to be wished that the Department would appoint a Lipton or a works manager to cleanse this Augean stable, and run it on business and common sense lines. In referring to Government departments let me say that the opinion of manufacturers and others who have to deal with them is that the Post-office Department is one of the best managed of Government institutions, and I am pleased to give its engineers their meed of praise. Senex.

CAUSES OF THE HIGH INFANTILE DEATH-RATE CONSIDERED.

In an article contributed to the *Englishwoman's Review*, Miss Florence J. Greenwood, Sanitary Inspector, deals with the above question. The title of her article is, "Is the High Infantile Death-rate Due to the Occupation of Married Women?" But in our opinion the real gist of Miss Greenwood's remarks would have been more clearly indicated by the addition of the words, "in factories and workshops," for this, in reality, is what she means. Miss Greenwood says:—

The eradication of erroneous ideas is a process both troublesome and difficult. They are generally so rooted in ignorance and prejudice that they crop up again and again after one might have supposed them to be entirely extirpated.

One such idea, which is firmly fixed in the minds of many people, and I fear will die hard, is that the high infantile mortality which takes place each year in our large towns is entirely due to the occupation of married women in factories and workshops.

Another is that if married women were forbidden by law to work, the death-rate of infants would at once decrease.

It is the object of this paper to show that sweeping statements of this kind are not in accordance with facts, and that such a measure as the one suggested would cause far greater and more widespread suffering than

already exists. It is true that students of vital statistics are concerned with the fact that although the death-rate of the country is being reduced (which is eminently satisfactory), the birth-rate is declining at an even greater rate; and, further, that the death-rate of infants under one year of age is enormously high—25 per cent. of the total number of deaths in England and Wales during the past ten years occurring during that age period.

The question of the high infantile mortality is a difficult and complicated one. It is due to a variety of causes, and a high percentage of occupied mothers may be one among them; but as Dr. Willoughby, in a paper on "Some Prevalent Fallacies in Vital Statistics," says:—"A very prevalent source of error in questions of this kind is the fallacy of ascribing to one particular cause, perhaps a real and powerful factor, but still only one among others not less powerful, the whole effect of a plurality of causes."

But is the occupation of mothers such a powerful factor?

Miss Clara Collet, in her reports on the employment of women and girls, points out (page 7) that the increase in the employment of women during the last decade has been very slight, and that it is due to the entrance of middle-class women into the wages market. Again, on page 27 she says:—"On the whole we seem justified in inferring that in these [factory] towns most affected by married women's labour, the percentage of married women employed is diminishing. Another point is noteworthy. In all these factory districts there is a marked diminution in the proportion of young married women between twenty and twenty-five." On page 27 Miss Collet further says:—"In such towns [Burnley, Preston, Stockport, &c.], where nearly all the girls under twenty, and half the women between twenty and forty-five are engaged away from home, we may naturally look for a high infant mortality, and expectation is justified by the facts."

But Miss Collet has told us that the employment of married women in factory towns is diminishing. We might, therefore, reasonably expect to find that the infantile death-rate, though high, is diminishing; but such is not the case. On the contrary, the Registrar-General's report for 1899 shows that in twenty-seven out of the thirty-three great towns *it has increased* during the past ten years, and in the half-dozen towns where it has decreased, the reduction is anything but a substantial one, while in Burnley it has *increased* enormously. The figures for 1899 in Burnley show 269 deaths under one year of age per 1000 births, being an excess of sixty-one over the average of the preceding ten years.

Are we to infer from this that strangers take better care of the babies than their own mothers? Or is it more in accordance with the experience of those who work amongst these people to say that the ignorant mother knows as little how to rear her child as the ignorant neighbour, and that the higher death-rate is due to other causes?

Miss Collet admits (page 27) that "the high infant mortality rates in Liverpool and Salford, where the percentage of occupied married women is not nearly so high [as in the factory towns], show that a high rate of infant mortality can coincide with a low rate of employment of women away from home."

It would appear, then, that the occupation of married women is not so important a factor as has been supposed, and the evidence of experts bears this out.

Miss Greenwood's contention points to negligence in the care of children as the predisposing facts in infantile mortality. Some opinions of experts in corroboration of this view conclude the first instalment of the article, which is interesting as being a woman's view of what is essentially a woman's question.

THE USES OF COMPOBOARD.

The introduction of a new material as a substitute for natural wood, which, in addition to possessing unique qualities and a wide range of adaptability, is at the same time sanitary, possesses claims upon our notice, which although it appeals mainly to builders and architects, we can hardly afford to ignore. The material in question is known as Compoboard, as it is, as its name implies, of a composite nature. Its basis, which forms its core or inner part, consists of a serried range or course of slats of well-seasoned and carefully-selected wood, each 1in. wide and $\frac{7}{16}$in. thick, cut perfectly plane and true, and cemented together edge to edge with a special fire-proof substance, which forms also the adhesive for the densely-condensed pulp boards by which the range of wood slats are covered at top and bottom—that is, on each side of the board. The materials thus arranged are subjected to immense pressure, and thus compacted into the most perfect union. The resultant Compoboard is a perfectly plane, rigid, solid, and homogeneous material, which can be sawn, nailed, screwed, glued, and, in fact, treated in every respect as if it were simple wood, with the advantage that whereas natural wood will warp, shrink, crack, split, and bulge, Compoboard is tractable, durable, and adaptable, in every respect.

In ceilings, one of the great difficulties confronting the builder is to get a surface that will not crack when there is traffic above or vibration from machinery. Compoboard gets over this difficulty, and ceilings treated with it may be distempered, papered, or finished off with any decoration, however heavy. It can be fitted without any truss or press, and there is no waiting while the stuff dries before it can be painted and papered. Its lasting qualities added to its appearance render it invaluable wherever the ceilings of warehouses, schools, factories, and public institutions are concerned.

In regard to walls, Compoboard is a first-class non-conductor of sound, and thus eminently suitable for partitions. For lining iron and wooden buildings nothing could be more appropriate. Changes of temperature fail to affect it—no small consideration in hospitals abroad, where otherwise openings or cracks would afford a lodgment for vermin. The homelike appearance of a plastered interior is also infinitely preferable to matchboarding, which Compoboard seems destined to supersede. Whenever alteration and repairs are necessary the efficacy of this well-tried material is beyond question, and has already been demonstrated in every direction; in fact, it is questionable whether any recent invention appealing to the building world has met with such instantaneous and unqualified approval.

We understand that the demand for Compoboard, already enormous, is steadily increasing, and it has already commended itself to the War-office and other Government departments. The railway companies are also largely using it for lining the better class of carriages; in fact, its all-round utility is little short of wonderful.

The space at our disposal is too small to do this subject justice, but we feel sure that any inquiries addressed to the British Compoboard Company, 18, Roscoe-street, Golden-lane, London, E.C., will be promptly dealt with.

Jacob Memorial.—It is proposed by many friends of the late Dr. Archibald H. Jacob, Dublin, to raise a memorial in testimony of his life-long work in the interests of the profession. Subscriptions may be forwarded to Sir Charles Cameron, C.B., 51, Pembroke-road, or L. H. Ormsby, Vice-president, R.C.S., 92, Merrion-square West, hon. treas., or to G. F. Blake, Registrar, Royal College of Surgeons, Stephens' Green West.

Public Works.

SEWERAGE.

THE Buckhurst Hill Urban District Council is requiring £2700 for works of sewage disposal.

THE West Bromwich Corporation contemplates a loan of £15,000 for the establishment of sewage works upon the bacterial system.

THE Rural District Council of Doncaster has under discussion schemes of sewerage and sewage disposal for Askern, Bawtry, and Bentley-with-Arksey.

A LOCAL Government Board inquiry was held at Maidenhead recently with reference to the Town Council's application for sanction to borrow £5000 for the extension of the bacteria treatment at the sewage outfall.

A LOCAL Government Board inquiry was held at Leicester last week, with reference to the appointment of the Corporation to acquire land for a sewage pumping station, &c., for the Belgrave District of the Borough. The Town Clerk (Mr. J. Bell) informed the Inspector that it was proposed to abolish the present sewage farm at Belgrave, and to pump the sewage up through a rising main to the Beaumont Leys Farm. There was no opposition.

AT a special meeting of the Armagh Urban Council held last week, a discussion took place regarding the carrying out of the sewerage scheme. The Town Clerk reported that there seemed to be a grave mistake in the levels of the pipes laid at the rear of the houses in Edward-street, and a consequent error in Mill-street. So far as he could see, the plans as contracted for were undergoing a remodelling. He called attention to these as the consequent expense would be serious. After hearing Mr. Peel's report, and considering the whole question, the following resolutions were unanimously passed:—"That this Council being in charge of the funds entrusted to it for sanitary and other purposes, hereby resolves that no extra work or works not directly set out in the specifications, plans, and sections in connection with the new sewerage scheme and disposal works shall be undertaken or begun without first being submitted to this Urban District Council." "That Mr. Parry be brought to Armagh immediately in connection with the Town Clerk's report and that Mr. Peddie is notified to attend, with Mr. Parry."

THE Selby Urban District Council having at a recent meeting resolved to oppose the Leeds Corporation (General Powers) Bill in so far as it proposes to empower the Corporation to purchase the Gateforth Estate for the purpose of establishing thereon a sewage farm, the necessary town's meeting was held last week at Selby to decide whether or not approval should be given to the proposed opposition. Mr. Scott, as chairman of the Waterworks Committee, stated that the cost of the opposition might be large, but it was possible the Leeds Corporation might withdraw the proposal. The Urban Council would not go to law if it could avoid it by some arrangement by which its interests would be safeguarded. It might be that the cost would have to be borne by the Corporation. Were the Selby Authority obliged to construct fresh waterworks, the cost would probably be £15,000 or £20,000. The nearest place from which they could obtain water in that event was, he was advised, Market Weighton. If the Corporation was prepared to suggest any plan by which the risk could be avoided, by which the Selby water would be secure from injury, or by which they would be entitled to compensation in case of injury—these were matters of detail—the Selby Authority would be only too glad to treat with them. It was finally resolved to approve the opposition of the Bill.

THE Newhaven Rural District Council is obtaining a loan of £1800 for Rottingdean drainage.

COL. MARSH held an inquiry on behalf of the Local Government Board recently into the application of the Hornsey, Tottenham, and Wood Green District Councils for permission to borrow £5620 in addition to the £75,000 which the Alexandra Palace Acquisition Act gives them power to provide without the sanction of the Local Government Board.

A FURTHER joint conference of the delegates appointed by the different District Councils in the Western Valleys of Monmouthshire for the purpose of deciding upon a scheme or schemes for draining the locality was held at the Abercarn District Council offices last week, the object being to meet the engineers, Messrs. Beesley, Son, and Nichols, who were appointed at the last meeting to consider and report to the conference on the matter. The County Surveyor explained briefly what it was the engineers were required to report upon. He said there had been one scheme before the county for a considerable time, and that was a trunk sewer right down the Valleys. The conference wished the engineers to go into the whole question and see which scheme was advisable. They wanted them to consider the septic tank or any other system which, as the result of a survey of the whole surroundings, the engineers might consider best. If they recommended one particular scheme the conference desired to have good reasons from the engineers for recommending it. It was finally agreed that the different members of this conference should form sub-committees in each district which they represented to consult with the engineers.

THE latest news received from Sydney, New South Wales, is to the effect that an inquiry was being held by the Public Works Committee into the expediency of constructing a system of sewerage for Newcastle, Hamilton, Wickham, Carrington, and Merewether. Dr. Dick, Medical Officer of Health, was giving evidence as to the character of the City Borough's existing sanitary arrangements. The sewers, he said, had apparently been laid in a haphazard fashion, and many instances of extremely bad construction had been brought to light. The workmanship was certainly not of the best, not even passable. In many instances the joints between the drains and the sewers were grossly bad. Bindings of rags and string to keep the pipes in position had been adopted in some cases, and the bye-laws of the Council even provided that clay might be used in making the joints. There was no plan of the household drains, and great difficulty in locating them was often experienced. Nuisances were created at the places where the sewers emptied into the harbour. It was optional with householders whose premises were not connected with the sewers how often they had sanitary services rendered, and the witness gave shocking examples of neglect or inadequacy in the matter.

WATER.

THE Plympton St. Mary Rural District Council has a large scheme of water supply under its consideration.

A LOCAL Government Board inquiry has just been held at Battle with reference to the application of the Urban Council to borrow £5000 for works of water supply.

THE Corporation of Tamworth, on behalf of the Tamworth District Waterworks Committee, recently presented a petition to the Local Government Board to issue a Provisional Order to empower it to put in force, with reference to certain lands required by them for purposes of water supply, the powers of the Lands' Clauses Acts with respect to the purchase and taking of lands otherwise than by agreement. The inquiry was held on Tuesday last by Colonel C. H. Luard, R.E., at the Town Hall, Tamworth.

The Foleshill Rural District Council has received a communication from the Local Government Board sanctioning the application of a loan for £1000 by the Council for Bedworth boring.

The directors of the Weardale and Shildon District Water Company have decided to recommend a dividend of 6 per cent. for the past half-year, which, with the interim dividend of 5 per cent. last July, will make the dividend for the year 5½ per cent., as compared with 5¼ per cent. last year.

The ultimatum of the West Riding County Council, calling upon the Thorne District Council to provide a new water and sewage scheme, has not been received with good grace by those villages directly affected. The scheme is estimated to cost not less than £7000, a quarter of which has to be raised by landowners.

At a special meeting of the Matlock Urban Council held recently the report of the experimental artesian boring for a new water supply for the town was received. It stated that a depth of 200ft. had been attained. Asked as to the maximum of the experiment, the Clerk said it was to be 300ft., but at 200ft. they had good prospects of getting to water.

The Derwent Valley Water Board Bill has just come before Mr. Campion, one of the Examiners of the House of Commons, for proof of compliance with the Standing Orders relating to the introduction of private Bills. There was no opposition at this stage, and the necessary formal proofs having been given, the Examiner decided that the Orders had been duly complied with. The Bill will accordingly in due course be reported for first reading.

Rugby Water and Improvement Bill came last week before Mr. Campion, one of the Examiners of the House of Commons, for proof of compliance with the Standing Orders relating to the introduction of private Bills. There was no opposition at this stage, and the necessary formal proofs having been given, the Examiner decided that the Orders had been duly complied with. The Bill will accordingly in due course be reported for first reading.

A special meeting of the New Mills Urban Council was held last week in regard to the proposal of the Council to promote a Bill in Parliament for powers to procure a water supply for the district, and construct waterworks near Hayfield. The business was transacted in committee. In compliance with a requisition, signed by twenty ratepayers, the Chairman of the Council has issued notices convening a public meeting for the purpose of receiving the consent of the owners and ratepayers to the Council's opposition to the Bill promoted by the Stockport Corporation to take the waters of and construct waterworks at Kinder; and also to authorise the New Mills Council to pay the cost of opposing the same in Parliament.

The South Essex Waterworks Company has deposited a Bill, under which power is sought to raise £375,000 additional share and loan capital, partly for the purpose of constructing additional waterworks and for the sinking of two further wells in the parish of Ilford. The new capital, of which £300,000 is to be raised by the issue of ordinary or preference shares, is to be offered by auction or tender. A clause in the Bill, of an unusual character, proposes to empower the urban districts of Illford, Barking Town, Grays Thurrock, and Romford, and the rural districts of Orsett and Romford, to borrow money for the purpose of paying the costs incurred by them in opposing this company's Bills of 1899 and 1900, and also for promoting a Bill, which was rejected, to acquire the undertaking of the company. Another clause proposes to authorise the company to pay out of capital its own costs of promoting its Bills of 1899 and 1900, and of opposing the Bill of the District Councils.

At the last monthly meeting of the Heywood and Middleton Water Board the Clerk reported that the Water Bill had been certified as complying with the Standing Orders of the House of Commons, and is included in the first fifty Bills to come before the Committee in the next session of Parliament.

Mr. M. K. North, Local Government Board Inspector, held an inquiry at Danbury last week into the application of the Chelmsford Rural District Council for sanction to borrow £4430 for the purpose of water supply in the parishes of Danbury, East Hanningfield, Little Baddow, Rettendon, Runwell, Sandon, and Woodham Ferris.

Lydford village water supply has not yet reached perfection. Since the water was turned on a few weeks ago two or three of the standpipes have burst, owing to the frost. None of the eight standpipes are protected, although the taps protrude very much, and there are no sinks or gutters to prevent the waste running over the roads.

The Hay (N.S.W.) Municipal Council has decided to improve the water supply by adopting the recommendation of the Government Engineer to erect two new duplex pumps to lift 40,000 gallons per hour, a new boiler, and an additional storage tank of 100,000 gallons capacity. The plant will be placed near the irrigation pumping station, and the water will be pumped direct from the river. The estimated cost is £6800.

At Tuesday's meeting of the London County Council a joint report, presented by the Water and Public Health committees, dealt with the series of new regulations which were adopted by the water companies last November, and with regard to which a Local Government Board inquiry is to be held at the Guildhall, Westminster, on February 11th, at 11 a.m. The Borough Councils were invited to a conference on the subject at Spring-gardens, but on account of the death of her Majesty this has been deferred until next Monday, February 4th, at 2 p.m. In the meantime the two committees reported upon the regulations in detail. They pointed out that expensive alterations would be required in existing fittings, at the expense of the owner of house property, that the companies propose to exercise an arbitrary power as to the pattern and position of fittings, including the course of the supply pipe right up to the cistern; and that the communicating pipe outside the house is required to be laid at a depth considerably greater than that of many of the street mains, defects in which have caused so much distress during frosts. The committees proposed that a series of amendments shall be submitted at the inquiry, by which some of the companies' expensive proposals shall be reduced, or shall not apply to efficient existing fittings, or shall be provided at the expense of the companies. They also proposed that in certain cases the Borough Councils, and not the water companies, should have the power to decide as to pipes and fittings.

LIGHTING.

Colonel Durnford held an inquiry at Harrogate last week with reference to the borrowing of £10,000 for electric lighting purposes.

The Scottish Office has decided that the Gas Order applied for by the Paisley Town Council in October last for powers to borrow a further sum of £25,000 for the electric lighting works will be granted on the terms asked, a local inquiry being dispensed with.

The Hartlepool Gas and Water Bill came last week before Mr. Campion, one of the Examiners of the House of Commons, for proof of compliance with the preliminary Standing Orders relating to the introduction of private Bills. There was no opposition at this stage, and the necessary formal proofs having been given, the Bill was ordered to be reported for first reading.

A Local Government Board inquiry has been held into the application of the Bradford City Council for power to borrow £140,000 for the extension of the City Electricity Works.

The Omagh Gas Bill came before Mr. Campion, one of the Examiners of the House of Commons, recently for proof of compliance with the preliminary Standing Orders relating to the introduction of private Bills. There was no opposition at this stage, and the necessary formal proofs having been given, the Bill was ordered to be reported for first reading.

The Gas Commissioners of the burgh of Falkirk have received a lengthy report from Mr. Gillespie, of Glasgow, who was called in by the Town Council to advise as to the suitability or otherwise of the Thornhill and Parkhouse grounds as a site for the new gasworks. He stated that he had no hesitation in recommending Thornhill site, provided the necessary railway accommodation can be arranged on suitable terms.

The Alfreton Urban Council is alive to its position in regard to the supply of electricity. It is seeking a Provisional Order from the Board of Trade for the purpose of supplying the town with electric light, while at the same time another move is being made in Parliament contemporaneous with the Council's application. A Bill is being promoted entitled the Derbyshire and Nottinghamshire Electric Power Company, and this is giving the Alfreton Council some anxiety. After consideration the Council has decided to oppose the Bill.

The Crawley Gas Company, Limited, has deposited a Bill for incorporation as a statutory company with powers to supply gas within the parishes of Crawley, Ilfield, and Worth, which is an area proposed to be supplied by the Horley District Gas Company under its deposited Bill for next session. The capital of the Crawley Company is proposed to be fixed at £20,000, which comprises £10,000 capital already raised, and £10,000 which is proposed to be raised as additional capital under the powers of this Bill. The dividend of 10 per cent. on the original capital is to be made dependent on a sliding scale based on a standard price of 4s. 9d. per 1000 cubic feet.

Either the Dalkeith Town Council has been living in blissful ignorance, or Messrs. Crompton and Co., who were to have lighted the burgh with electric light, have made a gross mistake, says the Edinburgh *Evening Despatch*. The Dalkeith Councillors in May of last year approved of a scheme by which light would be supplied at 3d. per Board of Trade unit, and by which the company would establish a complete installation at their own cost, even to the extent of erecting the arc and other lamps to be used in the public lighting. Now Messrs. Crompton and Co. intimate that they intended to supply the electric energy only at 3d. per unit. All the calculations of the Councillors have been upset, and a special meeting will be called for an early date, when a protracted discussion is likely to ensue.

A new system of electric lighting has just been perfected by Nikola Tesla in New York. Each lamp consists of 20ft. of glass tubes in rectangular form, wires and carbon filaments being entirely dispensed with. Under a full current of electricity the lamp has the colour of ice in the sun. The light is absolutely steady, closely resembling sunlight. The *New York Herald*, describing Tesla's discovery, says:—"Tesla's oscillator, which is employed in producing the new light, causes electric vibrations of inconceivable speed. These vibrations turn the atoms of the gases in the tubes into so many little comets, which shoot through enclosed space with tremendous rapidity, leaving trains of light behind. This sudden starting and stopping of the current produces continuous light, not of incandescent or arc-light character, but purely solar. In other words, each little lamp is a little sun."

After paying for the past half-year a dividend at the statutory rate of £4 8s. per cent. per annum, the Board of the Gaslight and Coke Company will carry forward a balance of £221,570.

At a special meeting of the Lowestoft Town Council, last Friday, Councillor Fry (chairman of the Electric Lighting Committee) informed the members that they would be ready to switch on the light by February 12th, and proposed to do so on that day.

Owing to the great increase in the number of electric light consumers, the St. Pancras Borough Council has decided to build another light-generating station at Kentish Town. This will make the third station. The Council desires statutory powers to lend fittings to consumers, and a conference of Local Authorities with that end in view is to be arranged by the Council.

The inhabitants of Shotton have taken a very wise step in deciding to light the district, it being intended to carry out a complete scheme of public lighting. At present lamps are lighted along the main road, and shortly additional lamps will be placed in the side streets. The district is rapidly increasing, and an excellent class of house property has been erected, and other houses are in course of construction.

In view of the attempt which is being made at Manchester by the Chairman of the Corporation's Gas Committee to secure for the gas consumers the benefit of a portion of the £50,000 profit which is annually handed over to the City Treasurer in relief of the general rates, special interest attaches to a Government return just published, giving minute financial details of all the municipal gas undertakings in the country.

GENERAL.

The Chiswick Urban District Council is taking steps to obtain a site for public baths.

A public meeting has been held at Ealing for the purpose of urging the municipalisation of hospitals.

The Board of Trade has sanctioned the borrowing of nearly £200,000 for the construction of tramways by the Bournemouth Town Council.

The Medical Officer of Health of Liverpool has been requested by the City Council to report the advisability or otherwise of establishing a voluntary system of notification of phthisis with payment to medical men of a small fee.

The Brighton Town Council has received the sanction of the Local Government Board to the borrowing by the Council of £34,652 for ten years for works for street improvements; £2830 for forty years for the purchase of land as a site for public baths; £560 for forty years for the purchase of land for street improvement; and £1100 for purchasing land as a site for a news-room.

In a short time the Fulham Borough Council will have in full operation one of the most important combined schemes of refuse destruction, electric lighting, and disinfection undertaken by a local body in London. Under the existing system the cost of refuse removal by barges is 1s. 11d. per load, which, on an average yearly collection of 40,000 loads, amounts to £3833. By means of the new destructor the cost, it is believed, will amount to only £2358, showing a net profit on the destructor of £1775. By using the destructor in connection with the new electric lighting works the burning of the refuse will be equal to the consumption of 2000 tons of coal, which, taken at 16s. a ton, shows a still further profit to this municipal undertaking of £1600 a year, and a still further saving of 500 a year is estimated to be made by combining the disinfector with the destructor and electric lighting schemes. Allowing 5¼ per cent. as interest on the sinking fund, the estimated net profit on the combined scheme is put down at £2728 per annum.

The Rochford Rural District Council has accepted a tender of £3810 for the erection of the hospital for infectious diseases, which it has decided to provide jointly with the Shoebury Urban District Council.

The Chailey Rural District Council has joined the East Grinstead Urban Council in a resolution calling upon the County Council to provide accommodation for the reception of small-pox cases occurring in East Sussex. The Newhaven Rural District Council, however, will take no action in the matter on the score of expense.

A Local Government Board inquiry was held in Liverpool last week relative to the application of the City Council to borrow £53,500 for the erection of labourers' dwellings wherein to re-house the tenants of insanitary property. The scheme was opposed on behalf of the Liverpool Property Owners' and Ratepayers' Association.

The Examiners of Private Bills of the House of Commons resumed the investigation of Standing Order proofs last Friday. Among the measures considered were the Notting-hill Electric Lighting, Bridewell Hospital, City and Brixton Railway (Extension of Time), Metropolitan District Railway, King's-road Railway, and the District Messenger and Theatre Ticket Company Bills. The total number of Bills to be examined prior to introduction and first reading is this year 235, and of these 209 have now been dealt with, the remainder being down for consideration last Monday, together with a few which had been postponed.

A meeting of the Huddersfield Chamber of Commerce was held last week. A deputation from the Yorkshire Electric Power Syndicate, including Mr. A. G. Lupton (chairman, Leeds), to solicit the assistance of the Chamber towards securing a parliamentary Bill, waited upon the Council. The Leeds Chamber of Commerce had promised to support the Bill by evidence if necessary. It was not a directors' or promoters' company, and its sixty shareholders were distributed all over the county. The capital at present was only £10,000 for the purpose of the promotion of the Bill. It was decided that before the Council passed any resolution on the subject, a deputation should wait upon the Huddersfield Town Council to ascertain how far the scheme would affect the Corporation.

Dr. E. H. Young, Medical Officer of Health for Okehampton, in his annual report to the District Council, says:—"For some little time past the United Devon Association has been taking steps in various directions to make the county more known to holiday makers and those looking out for a fixed place of residence. This desirable endeavour could and should be materially assisted by the Sanitary Authorities throughout the county, improving the health conditions of the people under their care. One of the most important ways of doing this is by systematic inspection of a district. As I have before pointed out, the visit of the Sanitary Inspector not only leads to improvement of the house and its surroundings, but is at the same time an object lesson in the cause of sanitation. For the first five years that I was your Medical Officer of Health you had had one Inspector (Mr. Hooper) who did nothing else but sanitary work. The taking over of the roads led to a change. Two Surveyors were appointed who were also Sanitary Inspectors. After five years' experience of each of these arrangements I feel sure that more sanitary work was done in the former period than in the latter. Both Mr. Hooper and Mr. Smale were hard-working, able and conscientious men, but with the amount of road work under their control, work which must be attended to, as it was constantly under survey, the time available for sanitary work was reduced to small proportions. It would be advisable to go back to the old plan of leaving one man for sanitary work only, even if it was necessary to keep two for roadwork."

The Ilford Urban Council desires to enlarge the Isolation Hospital, at an estimated cost of £9445, by providing accommodation for twenty-six beds. The number of beds in the hospital at present is twenty.

The Sanitary Authorities in Leeds are taking the utmost precautions as to the detection of, and dealing with, cases of bubonic plague. The lodging-houses and canal boats are very closely watched, and their owners and occupiers have been circularised on the subject.

On Tuesday the Secretary for Foreign Affairs notified to the Hull Sanitary Committee the receipt of a notice from the Netherlands Government to the effect that Hull had been officially declared infected with plague, and that the provisions of the Venice Convention would be applied to any vessel which left Hull ten days or less before January 21st last.

Dr. Cameron, the Medical Officer of Health for Leeds, has issued a notice to keepers of lodging-houses, masters of canal boats, and others, asking them to notify any case of plague which may occur on their premises. He reminds them that while plague in some of its forms is very easily recognised by the glandular swellings (wax kernels) it is by no means easy to detect it in all cases. It is therefore desirable that parties receiving into their houses any person suffering from a severe attack of what might be considered influenza, from any illness of the nature of inflammation of the lungs, blood poisoning, or any obscure symptoms of a feverish description, should immediately obtain medical assistance, and if there should be any suspicion on the part of the medical man called in that the disease might be some obscure form of plague to at once report the matter to Dr. Cameron.

Dr. W. K. Bullmore, Medical Officer to the Falmouth Urban Sanitary Authority, has just issued his annual report, in which he states that the improvement of the sanitary condition of the district had been the very earnest desire and the successful aim of the Authority. All the suggestions that had been made from time to time had been carefully considered, and, as far as practicable, carried out. He attributed the remarkably low death-rate to the improved dietary of infants, which had been largely brought about through suggestions thrown out from time to time by the Authority. Referring to the water supply, the Medical Officer states that it is a very fair sample of surface water, and has been certified as quite wholesome by some of the best-known analysts. It occasionally contained at certain periods of the year a peaty deposit, which went to show that a better system of filtration was necessary. During the year 350 children had been vaccinated, but no prosecutions had been taken under the Act.

The report presented by the Highways Committee at the meeting of the London County Council on Tuesday was principally concerned with tramways. The Committee proposed to transfer in relief of rates from the profits on tramways a sum of £40,000 on account of the £80,500 for which allowance was made in the estimates. The receipts of the South London tramways for the past three years were given. In 1898 (the last year under the company) they were £431,352; in 1899, £439,310; and in 1900, £441,408. Of last year's receipts, £8443 were from the all-night services. The Committee propose to invite representatives of the Borough Councils to a preliminary inspection of the specimen electrical car and plant at the Council's Camberwell depôt on February 14th. It is proposed also to construct immediately two short lengths of tramway in North London, already authorised—one along Crowndale-road, connecting the King's-cross and Euston routes to the north, and the other in Agincourt-road and Constantine-road, Hampstead, relieving the traffic along Fleet-road to Hampstead Heath.

PERSONAL.

Mr. H. Allen has been appointed Medical Officer of he Crediton union.

Mr. A. J. Troughton has been appointed Medical Officer for Bentham.

Dr. Dwight Morris has been reappointed Medical Officer of Health for Sunbury.

Mr. H. J. Marten has been appointed Surveyor for the eastern district of Wandsworth.

Mr. S. Davies has been appointed Medical Officer of Health for the borough of Woolwich.

Mr. Sumner has been appointed Sanitary Inspector for Driffield, at a salary of £100 per annum.

Mr. P. Dodd has been appointed Surveyor for the western district of the Wandsworth borough.

Mr. L. J. Veit, of Barrow, has been appointed Engineer and Surveyor for the urban district of Goole.

Mr. R. J. Angel has been appointed Borough Surveyor for Bermondsey, at a salary of £500 per annum.

Dr. Peter Thompson, of Owens College, Manchester, has been appointed Lecturer on Anatomy to the Middlesex Hospital Medical School.

Mr. William H. Roberts, fitter in the Broughty Ferry Gasworks, has been appointed Manager of the gasworks at Newtownards, Ireland.

Dr. Young has been unanimously reappointed Medical Officer for Rochford, and Mr. C. E. Judd has been reappointed Inspector of Nuisances.

Mr. Charles Brown, Burgh Surveyor, Airdrie, has been appointed Borough Surveyor and Sanitary Inspector for the burgh of Hawick, at a salary of £210 per annum.

The Local Government Board has sanctioned the reappointment of Mr. O. Osborne as Medical Officer of Health for the urban district of Bexhill, at a salary of £50 per annum.

The Local Government Board has sanctioned the reappointment of Messrs. Taylor and Dale as Medical Officer of Health and Inspector of Nuisances for Smallburgh, respectively.

Dr. Dudfield, of Paddington, has been temporarily appointed to carry on the duties of the Medical Officer of Health for the City until the late Dr. Sedgwick Saunders' successor is appointed.

Dr. William Collingridge, Medical Officer of Health of the Port of London, has come forward as a candidate for the office of Medical Officer of Health for the City, rendered vacant by the death of Dr. Sedgwick Saunders.

Mr. J. Harper, assistant valuer to the London County Council, was on Tuesday appointed chief of the Statistical Department, in succession to Mr. Gomme, promoted to the Clerkship of the Council. The commencing salary is £900 per annum.

A brass tablet has been erected in St. John's Church, Woking, to the memory of the late Sir Richard Thorn-Thorne, K.C.B., F.R.S., F.R.C.P., Medical Officer of Health to the Local Government Board, by the members of the Medical Department of the Board "as a mark of the esteem and regard in which they held their chief, and in appreciation of his services to the nation."

Dr. Dudfield, Medical Officer for the Borough Council of Kensington, has had his salary raised from £900 to £1000 per annum, the rise being sanctioned by the Local Government Board, on condition that he gave up all other income, or rather, agrees to confine his services to the Council. He has, in pursuance of this agreement, given up his position as Poor Law Medical Officer to the Board of Guardians.

NOTES AND QUERIES.

Subscribers may obtain advice on matters appertaining to Public Health Law and Municipal and Sanitary Engineering. Letters should be addressed "Notes and Queries," The Sanitary Record, 5, Fetter-lane, London, E.C. If an answer be required immediately, a stamped addressed envelope must be enclosed

2076.—Women Sanitary Inspectors: Salaries Paid.—"W." writes:—"Some time last year a return appeared in your columns of the women appointed, and the salaries paid as Sanitary Inspectors, Health Visitors, and Workshop Inspectors. Would you kindly give me the reference to this return, as I have not been able to trace it through the index?"

Answer.—The return referred to appeared in our issue of June 23rd, 1899, Query 1512, and gave a list of towns where Women Sanitary Inspectors are appointed, and the salaries paid to such Inspectors.

2077.—Examination for Inspectors of Weights and Measures.—"J. J. G." writes:—"I should be much obliged if you would inform me if there is any institution where I might take a preparatory course, which will cover the subjects required for the Board of Trade examination for Inspectors of Weights and Measures."

Answer.—There is no institution to our knowledge which provides a special course of instruction for persons studying for the examination referred to. A course of tuition by correspondence through the post is obtainable, and to be recommended, and an advertisement by a professional coach has from time to time appeared in our columns.

2078.—New Sewerage System: Connecting Old Drains to Sewer.—"H. D." writes:—"I enclose sketch showing a number of houses, the drainage of which was to cesspools. The distance of the houses is more than 100ft. to the new sewer. Is it the duty of the Local Authority to lay the sewer or otherwise?"

Answer.—We assume that the Local Authority are constructing a new sewerage system, and the question is directed to ascertain whether the owners of the houses now drained into the cesspools can be required to connect their drains into the new sewers. If we interpret the query correctly, which is very indefinitely put, we have to state that if the existing drains to the houses are sufficient for their effectual drainage, although drained into a cesspool, it will be the duty of the Local Authority to connect the drains to the sewer under Sec. 24 of the Act of 1875, and for that purpose to construct such a sewer as may be necessary.

2079.—Sanitary Association of Scotland: Certificate.—"J. W." writes:—"Will you please advise whether the Certificate of the Sanitary Association of Scotland would be recognised by Local Authorities in England, when applying for a post as Sanitary Inspector?"

Answer.—The certificate of the Sanitary Association of Scotland is, so far as a test of a candidate's sanitary knowledge is concerned, of equal value with that of a certificate by a similar English body. But such certificate does not testify to the candidate's knowledge of the Public Health Acts (England), and in this respect a candidate for an English position is somewhat at a disadvantage. It is impossible, of course, for us to determine whether a Local Authority would look upon the Scotch certificate as equal to that of an English one. It is generally prescribed that candidates for vacancies for Sanitary Inspectors under the Public Health Act, 1875, should possess the certificate of the Sanitary Institute, but this is not always insisted upon, and the querist may apply for such vacancies.

2080.—Knackers' Yards: Licensing of, Vested in District Councils.—"Leo" writes:—"(1) By Sec. 27 (2) of the Local Government Act, 1894, the powers, duties, and liabilities of Quarter Sessions in relation to the licensing of knackers' yards are transferred to District Councils, and I believe these powers are contained in the Knackers Acts, 1786 and 1844. (2) Would you kindly say whether any parts of these Acts have been repealed, or whether the whole of them are now in force in rural districts? I refer more especially to Sec. 14. Will you also please state whether Sec. 14 could be held to exempt horse slaughterers who buy dead or live horses, cut them up, and sell hides, bones, flesh, &c., for profit?"

Answer.—(1) The licensing of knackers' yards is transferred to Urban and Rural District Councils by Sec. 27 (2) of the Local Government Act, 1894, and, as the querist rightly assumes, the Knackers Acts, 1786 and 1844, apply. Secs. 1, 2, 7, 13, and 14 of the Act of 1786 only are in force, and Secs. 1, 2, and 10 of the Act of 1844. (2) By Sec. 14 of the Act of 1786, the Act does not apply to any currier, fellmonger, tanner, or dealer in hides. It does not appear that a horse slaughterer who amongst other

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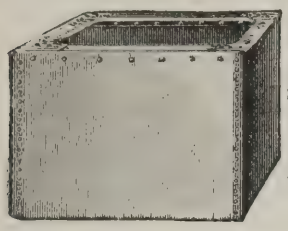

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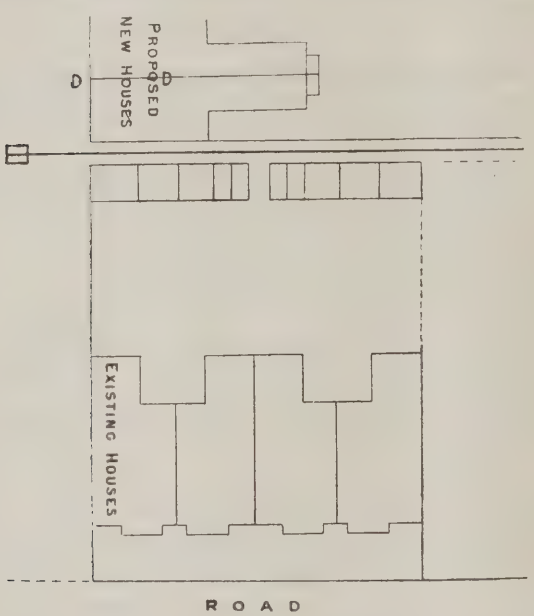
2081.—Old Highway becoming New Street.—"Clerk" writes:—"I submit plan showing an old highway alongside which four cottages were erected in 1898. At the same time the foundations of a new road were laid along the flank of the end cottage. While these were being erected, the land on the opposite side of the new road was sold, and the road was left 30ft. wide. Did the erection of the four houses constitute C a new street? My Council have before them a plan for two new houses at D on the same side of the street as the end of the four cottages



abuts on. These two houses have a frontage to the road. Can the Authority refuse to pass the plans on the ground that their erection would constitute the road a new street of less width than that required by the bye-laws? The estate is altogether a new one, and there is no other erection of any kind thereon. I may add that at the time the erection of the four houses was commenced, the bye-laws relative to the construction of new streets and buildings had not been confirmed by the Local Government Board. The bye-laws now in force require streets to be 36ft. in width. The street previously referred to has not been made beyond the foundations being put in for a width of 30ft."

Answer.—It is a question of fact for the determination of the magistrates as to when a person is laying out a new street. Decided cases are very conflicting. In the case before us houses are being built on one side of a street, the width of which—if the evidence of a paved foundation may be accepted as determining such—is only 30ft., while the width of a new street as required by the bye-laws should be 36ft. No houses are being or have been built on the opposite side of the street. The proposed new houses are in line with the flank wall of the existing house. In our opinion, the Authority would not be well advised in refusing approval of the present plan on the ground that the owner is laying out a new street of less width than that required by the bye-laws. The proper course for the Authority to adopt is to ensure that, when the owner of the land on the opposite side of the street proposes to build, and submits his plans, the proper width of 36ft. be provided.

2082.—Power to Restrain Keeping of Fowls: to be Restrained by Private Act: Information Required.—"K. W. J." writes:—"The Corporation of this town are preparing a Bill to be submitted to Parliament with the object of obtaining additional powers for various improvement schemes. The sanitary department would like a clause inserted in the Bill giving them power to prohibit (under any conditions) the keeping of fowls in yards of dwelling-houses, the keeping of such not being conducive to health and cleanliness. Are you of opinion that the Sanitary Authority would be successful in their application for such powers, or do you know of any Corporation where such powers are in operation? I should be glad of any information."

Answer.—Whilst we are of opinion that the keeping of fowls in populous urban districts should be regulated by bye-law, we are of opinion that the Legislature would hesitate before giving a Local Authority power under a private Act to entirely prohibit the keeping of fowls in the yards of all dwelling-houses. The Local authority's law officers might, however, in the case named by the querist, draft a clause in the Bill enabling the Authority to regulate the keeping of fowls at a certain distance from dwelling-houses, and as to the prohibition of their being kept in yards of a restricted area. We do not know of any case where the powers named have been obtained by private Act. We shall, however, be greatly obliged if any of our correspondents can supply the information.

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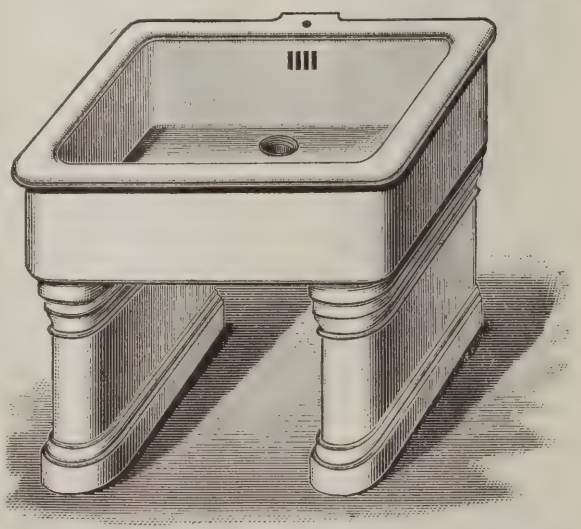

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(*Continued from page* 22.)

CHAPTER XVI.—TRANSFORMERS.

We have already mentioned that the electric unit of power, the volt-ampère or watt, equal to about $\frac{1}{746}$ of a horse-power, is the product of one volt and one ampère. Thus the power of a current of 100 ampères at 10 volts pressure is one kilowatt equal to about $1\frac{1}{3}$ horse-power, and the power of a current of 10 ampères at 100 volts pressure is also one kilowatt.

The sectional area of the wire along which a current is conducted is dependent on the ampères of current; thus to conduct a current of 100 ampères a copper wire having an area of about 50 square millimetres is required; whereas to conduct a current of 10 ampères an area of about $2\frac{1}{2}$ square millimetres is sufficient, quite independently of the voltage of the current.

The power which can be transmitted electrically by means of a wire having a given area varies, therefore, with the pressure or voltage of the current; thus, along a copper wire having an area of 50 square millimetres, equivalent to about a quarter of an inch diameter, one kilowatt, equal to $1\frac{1}{3}$ horse-power, can be transmitted with a current at 10 volts pressure; or 10 kilowatts, equal to $13\frac{1}{3}$ horse-power, with a current at 100 volts pressure; and 100 kilowatts, equal to $133\frac{1}{3}$ horse-power, with a current at 1000 volts pressure.

These figures are only approximate, and meant to show the relation that exists between the powers that can be transmitted at different voltages, as no general rule can be laid down for determining the size of a wire to conduct a given current; since, owing to internal resistance, the wire becomes more or less heated, with a consequent loss of current.

By increasing the sectional area of a wire its conductivity is increased, and there will be less current absorbed in the shape of heat.

It is obvious that there will be a greater loss in conducting a current along a very long wire than along a very short one, and the loss is proportional to the length of the wire; so that if the conduction of a current along a very short wire results in a certain percentage of loss, whereby the wire becomes appreciably warm, by increasing the length without increasing the sectional area of the wire a point will eventually be reached where the whole of the current is absorbed in the shape of heat, and none is available for other purposes.

The main point to be considered in determining the size of the wire, where a current has to be conducted a very long distance, is the capital which must be spent on the conducting wire, and to what extent this may be increased to minimise the loss of current in the wire by increasing its area, so that the money representing the extra current obtained thereby covers the interest on the extra outlay. This is, of course, a very complicated matter, and requires very deep and careful calculation.

From the foregoing it will be clearly understood that to conduct a current of electricity to any considerable distance economically a high voltage must be employed, so as to reduce the quantity of copper in the wires as much as possible.

On the Continent and in the United States of America currents of as high a voltage as 10,000 or 12,000 are by no means infrequently used for transmitting power electrically to very great distances, and there are instances where even 30,000 volts are attained. There are isolated instances of continuous currents being employed for transmitting power to very great distances at very high voltages reaching up to 15,000, but it is impossible with one machine to generate a continuous current of such a high voltage as this. In such cases several generators must be used connected in series, so that the current generated by the first passes on to the second, and from this to the third, and so on, the voltage being increased as the current passes through each successive machine, but the difference of potential between the positive and negative terminals of any one machine may not exceed about 2000. And in the same way at the receiving station, where the current is conducted, it drives a number of motors connected in series.

In Switzerland, where a continuous current of 14,400 volts is generated at Combe-Garrot and conducted a distance of twenty kilometres to Chaux de Fonds, nine generators are used, connected in series, so that the difference of potential between the positive and negative terminals of any one generator does not exceed 1800 volts, and at the receiving station the motors work with a maximum difference of potential of 600 volts between each of their positive and negative terminals.

It is possible, although difficult, to construct good dynamos to generate a continuous current of 2000 to 3000 volts, or even more, but the difficulty of effectively insulating these machines and constructing them so that no sparks are formed at the commutator is so great, and involves a so much greater cost, that such high voltages cannot be generated economically, nor is this of very great importance in these days, when alternating currents can be generated so easily to serve the same purpose, namely, to transmit power from one place to another at a very great distance away, and when alternating machines have reached such a high state of perfection.

The employment of such high voltages is, of course, not without some considerable danger connected with it which must be carefully guarded against, as a shock might result in instant loss of life or permanent disablement of a person, and the insulating material surrounding wires in contact with metals or other conducting substances must be very perfect, as it is otherwise very liable to be punctured by the current in its endeavours to force itself a way through and escape.

For general motive purposes or for driving motors which require to be frequently reversed a continuous current of from 100 to 500 volts is most frequently and satisfactorily employed.

Incandescent lamps are now made giving satisfactory results when used with a current at 220 or even 250 volts, but the life of the lamps is shortened to a prohibitive extent by raising the voltage beyond this. The most common voltage for lighting with incandescent lamps is 100, and it is only within the last few years that manufacturers have been able to put on the market a durable and efficient lamp for use on 220-volt circuits. Alternating currents can be generated at a much higher voltage and with greater ease than continuous currents, for the sensitive part of the continuous-current generator, namely the commutator, does not exist in the alternating machines, as these have only simple slip rings and brushes for collecting the current.

There is also another reason why alternating currents can be generated advantageously at a very high voltage, whereas continuous currents cannot. A high-voltage current is only advantageous in transmitting power between two distant places, on account of the saving that can be effected in the conducting wires, but for use in the ordinary way for motive purposes it is extremely inconvenient, as well as dangerous, and for lighting purposes altogether impracticable. With alternating currents the voltage can be raised or lowered with the greatest ease by means of transformers which have no rotating parts, consequently require no attention and have also a very high efficiency; that is to say, there is only a very slight loss of power in transforming an alternating current from a high to a low voltage, or *vice versâ*.

A current is generated at, say, 2000 volts, and by

means of transformers this voltage is raised to, say, 30,000, so as to economise in the wires necessary to conduct the current to a receiving station at a far-distant town where it is to be utilised for lighting purposes. At the receiving station the current of 30,000 volts is transformed into one of 2000 volts, and in that state conducted to the different houses, at each of which it is again transformed to 100 volts, so as to be suitable for lighting with incandescent lamps. In this way a great saving is effected in the conducting wires, and inside the town the voltage is kept down to within reasonable and convenient limits.

Transformers for continuous currents are combinations of a dynamo and a motor, and have consequently the disadvantages of both, besides being comparatively expensive machines. The motor receives the current at a high or low voltage and drives the dynamo, which is wound to generate a current of the required voltage.

For example, a 100-kilowatt machine generates a continuous current of, say, 100 ampères at 1000 volts pressure, which must be utilised for lighting purposes a considerable distance away.

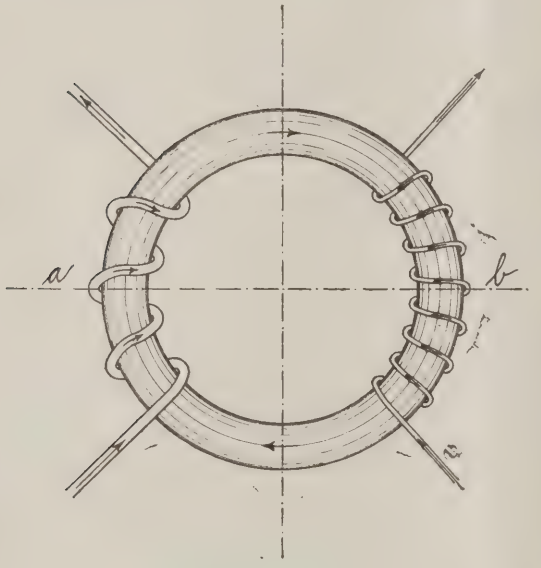

Fig. 27.

This current drives the motor-dynamo, which transforms it into one of nearly 1000 ampères at 100 volts pressure, there being some loss of power due to the internal resistance of the machine itself. Rotary transformers consist sometimes of two separate machines, a dynamo and a motor, mounted on one base-plate and firmly coupled together; but usually a special machine is used furnished with a double armature having two separate sets of coils with two commutators mounted on one spindle, one half working as a motor and causing the spindle to rotate while the other half works as a dynamo and generates a current. These machines can also be made for driving with an alternating current and generating continuous, or for driving with a continuous current and generating alternating.

For altering the voltage of alternating currents stationary transformers are used, which are altogether unlike the rotary transformer for continuous currents, having no working parts whatever, consequently they have a very high efficiencey and require no more attention than the conducting wires.

In its simplest form this class of transformer consists of an iron ring having a primary and a secondary coil of insulated copper wire wound round it in the manner shown in Fig. 27. The two ends of the primary coil *a* are connected with the positive and negative terminals of a generator so that a current passes through the wire forming the coil, causing lines of force to circle round it, which travel through the iron ring and magnetise it.

As the magnetic lines of force traverse the portion of the iron ring where the secondary coil *b* is wound they are intercepted and cut through by the wires, thus causing opposing lines of force to circle round them, and a current of electricity to flow through the secondary coil *b*.

Coil *a* receives its current direct from the generator, and is therefore primary, whereas the secondary coil *b* receives its current by induction.

If both coils consist of an equal number of turns round the iron ring, the same number of lines of force which circle round the wire forming the primary coil and which magnetise the iron are cut through in the same time by the wire forming the secondary coil, and the induced or secondary current will be theoretically exactly the same as the primary.

If the secondary coil has more turns than the primary the voltage of the secondary current will be higher than the primary; for a greater number of lines of force will be cut through in a given time by the secondary coil than are emitted from the primary coil, but the ampères of the secondary current will be less than the ampères of the primary, the product of the volts and the ampères or the watts being theoretically the same in both the primary and secondary currents. If, on the other hand, the primary coil has a greater number of turns than the secondary, the voltage of the secondary current will be lower than the voltage of the primary, but the ampères will be increased.

In the figure the coil *a* consists of four turns and *b* consists of eight. Assuming that *a* is the primary coil having a current of 20 ampères at 100 volts pressure flowing through it, the current induced in coil *b* will be nearly 10 ampères at 200 volts pressure. There will be some loss of power due to the resistance to the electric current in the coils and to the magnetic lines of force in the iron core, and some also due to the fact that not all the lines of force are utilised for inducing a current in the secondary coil, as some manage to escape through the air instead of through the iron core and past the secondary coil.

Transformers of this class are merely practical applications in their simplest possible form of the principles enumerated in Lenz's law. That is to say, an alternating current flowing through a coil of insulated copper wire, surrounding a piece of iron, constantly magnetises it alternately in opposite directions, and causes a constant change to take place in a magnetic field in relation to an electrical conductor placed within its influence, namely, the secondary coil, and thereby produces by induction an alternating electric current in the secondary coil.

It is clear that if a continuous current were to flow through the primary coil an alteration in the magnetic field in relation to the electrical conductor forming the secondary coil would only take place at the instant when the current is turned on or off, thereby momentarily inducing a feeble current in the secondary coil. These transformers, therefore, can only be used with alternating currrents.

Properly constructed transformers for alternating currents of from 5 to 200 kilowatts have an efficiency of about 93 to 98 per cent., the larger ones having a higher efficiency than the smaller. That is, about 2 to 7 per cent. of the current is lost in the process of transformation through the internal resistance of the machine when used with the full current for which it is constructed, but when used with a weaker current the percentage of loss is considerably greater.

(*To be continued.*)

TUBERCULOSIS—INFECTION, HEREDITY, PREVENTION, HYGIENIC TREATMENT.

By A. G. Young, M.D., Secretary State Board of Health, Maine, U.S.A.[1]

INTRODUCTORY.

The purpose of the following paper is to teach that tuberculosis is a preventable disease, and that, in the early stage particularly, it is curable. The mortuary statistics which have been compiled in various places since the significance of the discovery of Koch's bacillus has received general recognition by medical men, show very clearly the preventability of tuberculosis. At the last congress for the study of tuberculosis held in Paris, Professor Grancher[2] declared that pulmonary tuberculosis is the most curable of chronic maladies; and M. Jaccoud,[3] the eminent professor of the Ecole de Médécine, Paris, long recognised as one of the best authorities on pulmonary diseases, taught that "curable as tuberculosis is by the fibroplastic process while in the crude state, and during the whole period of softening, it is so also when ulceration occurs and caverns form. The knowledge that recovery is possible under these circumstances dates from ancient times; the facts which established both the truth of this statement and the anatomical mechanism by which it occurs are classical, and there is no need to insist now upon these points."

But before the full significance of the truth of the preventability and the curability of this disease can permeate the mind of the lay or professional thinker, and can move communities to more than half-hearted and half-successful efforts to stamp out the pestilence, correct ideas must prevail in relation to the questions of infection and of heredity. The full truth about the infectivity of tuberculosis and the limitations of the influence of infection can have no other than an assuring and helpful influence. The continuation of the erroneous dogma of heredity as a predominant factor in the causation of the disease is an incubus which paralyses the patient's hope of cure, and stays the hand of private and public benefaction.

The mortality from tuberculosis.—Among all the infectious, epidemic, or pestilential diseases, tuberculosis is the most terrible destroyer of human lives; in most civilised countries it is, indeed, the cause of a larger number of deaths than are caused by all the other infectious or so-called zymotic diseases combined. In the State of Maine, while the mortality from the whole list of the other infectious diseases[4] was 6266 deaths during the seven years 1892-98; the disease tuberculosis alone, in its various forms, destroyed 9735 lives in the same period.

The social and economic aspect.—Of the 9735 deaths from tuberculosis, 8429 of them fell victims to pulmonary tuberculosis, popularly called consumption. Of these 8429 persons who died of consumption, there were about 6480 between the ages of 15 and 60.[5] These persons may therefore be said to have died during their industrial or productive age, when death entails the greatest loss upon the family and the State. How serious the financial and social burden of tuberculosis is but few persons stop to think. Assuming that the average value of each of these 6480 persons would have been only 500 dols. each if they had not been cut down, we find that over 3,000,000 dols. of the State's productive capital has been swept away—more than enough to cancel the whole indebtedness of the State. Add to this the loss of labour due to partial or total disability for a prolonged period before death, the loss of labour by relatives and friends, the cost of medical attendance and nurses and medicines during illness; the value of the other 3255 lives lost by tuberculosis and not included in the foregoing conservative estimate, and the incidental expenses of their illness, and the cost runs so high into the millions that it should serve to "stagger humanity," as a present much-quoted prediction puts it. And even this is not the whole tax levied and collected by this one disease, tuberculosis. It has been estimated that for every person who dies of tuberculosis five recover.

INFECTIVITY.

The question of infectivity.—As to the fact that tuberculosis is an infectious, or communicable disease, there should no longer be a question even among the non-professional classes. Most intelligent persons know something of the infectiousness of tuberculosis, although few understand the full significance of the fact—that practically the whole terrible prevalence of the disease in the human race is due to infection. On the other hand, much which is now known of the infective agent and of the ways in which infection occurs, is assuring. Of the extent of the danger of infection and of the limitations of the danger, it will be the object of the remainder of this paper to explain.

The infective agent.—The essential cause of this disease is the bacillus of tuberculosis. It is a micro-organism of slow growth, whether inoculated into artificial culture media by the bacteriologist, or implanted in the human body through inhalation or otherwise. This characteristic favours the infected body in affording time for the rallying of the defensive forces of the organism. On the other hand, the germ of tuberculosis has, in quite a marked degree, the power of resisting or surviving the action of many natural and artificial agencies which have a tendency to destroy most disease germs. This increases the sphere of mischief of the bacillus by prolonging the period during which rooms or clothing, for instance, may remain infectious and dangerous, after they have once become infected. How long the bacillus will retain its virulence in dried sputum is a question of much practical importance. In the experiments of Schill and Fischer[6] its infectiousness was retained 95 days; in other experiments its virulence was partly lost in 186 days, and wholly gone in 226 days, or seven months and a-half. Dr. Pietro De Toma[7] found that dried sputum preserved its virulence nine or ten months under favouring conditions, but that under less favourable conditions the life of the tubercle bacillus was destroyed in a much shorter time. The conclusions of Sormani[8] are that the bacillus, whether dry or moist, retains its virulence for at least two months. Cornet[9] believes that we may assume that the bacillus of tuberculosis in dried sputum loses its virulence within three months on the average, but may retain its infectious attributes six or eight months under some circumstances. An observation of Dr. H. C. Ernst[10] indicates the possibility that the virulence of this germ may sometimes be preserved much longer than is suggested by the work of the preceding investigators.

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[1] Reproduced, by special permission of the author, from the eleventh report of the Maine State Board of Health, U.S.A.

[2] Congres pour l'Etude de la Tuberculose, 1898, page lv.

[3] Curability and Treatment of Pulmonary Phthisis, page 18. 1885.

[4] Small-pox, chicken-pox, measles, German measles, scarlet fever, typhus fever, influenza, whooping-cough, mumps, diphtheria, croup, tonsilitis, cerebro-spinal meningitis, tetanus, typhoid fever, simple continued fever, malarial diseases, and other specific febrile diseases.

[5] Five thousand seven hundred and six died between the ages of 20 and 60, and statistical study elsewhere than in this State render it probable that as many as 774 of the 1033 persons who died of consumption between the years 10 and 20 had reached their 15th year; hence the number 6480.

[6] Mittheil. a. d. Kaiserl. Gesundheitsamt II., 133. 1884.

[7] Giorn. della Reale Societa Ital. d'Igiene IX., 375. 1887.

[8] Uffelmann's Sup. 4th year 146. 1887.

[9] Die Tuberculose, page 27. 1899.

[10] Mass. Assoc. of Boards of Health, iv., 7. 1894.

Tuberculous sputum stood in jars in his laboratory nearly four years. The dried-up sputum, nevertheless, still contained living virulent bacilli.

Other questions.—The answers to some other questions also serve as a guide in choosing unobjectionable methods of disposing of tuberculous matter. As a general rule the infectivity of the tubercle bacillus is lost more quickly in moist than in dried sputum. The bacillus is overrun and destroyed by the ordinary bacteria of putrefaction. Falk, Baumgarten, Fischer, and Toma found that its vitality was lost in water in a few days at ordinary temperatures. Galtier,[11] however, learned that the virulence of the bacillus in small fragments of putrefying tubercular tissue in water was maintained from 8 to 17 days. Low temperatures merely inhibit the development of the tubercle bacillus, but its vitality remains unimpaired after exposure to intense cold, or prolonged freezing and thawing. The most potent of natural agencies in the destruction of tubercular infection is light. Exposed to direct sunlight the bacillus in sputum is, according to Koch, destroyed in from a few minutes to a few hours, depending upon the thickness of the layer of material to be acted upon. Dr. Migneco, of Italy, and Ransome and Delépine fully confirm the statement that light, particularly direct sunshine, is a rapid disinfectant of tubercular matter. Diffused light has an influence in the same direction, but acts much more slowly.

Infection as a cause of tuberculosis.—Infection is not only the predominant cause of tuberculosis, but, so far as concerns the prevention of the disease or the prognosis of recovery from it, infection may be considered as the exclusive cause. In the past, heredity was assigned a prominent position among the causes of tuberculosis, but now a large majority of the most eminent medical practitioners and teachers are convinced that direct heredity is but a small etiologic factor, while most of the cases of tuberculosis are referable to infection.

Of the ways in which the tubercular parasite finds an entrance into its host, and starts a new infection, only the most important—the most frequent—will be mentioned in this paper. By far the greatest number of infections are the result of inhaling the bacillus in dried tuberculous sputum.

The danger of infection by inhallation and its limitations.—The prodigality of Nature in her provisions for the perpetuation of the lower species of organisms is nowhere more apparent than among the bacteria. "Dr. George A. Evans, in a paper read before the King's County Medical Society in 1894, gives the result of some experiments made by Dr. George F. Nuttall, of Johns Hopkins University, that in the sputum of three cases undergoing the Koch treatment the number of bacilli expectorated in the first case in twenty-four hours was 2,000,000,000, in the second case the number varied between 20,000,000 and 165,000,000 on the days preceding the Koch inoculations. In another case not undergoing the Koch treatment the number of bacilli varied between 300,000,000 and 4,000,000,000. According to Bollinger, one cubic centimetre of phthisical sputum contains from 810,000 to 960,000 bacilli; the average consumptive, therefore, expectorates between thirty and forty millions of these parasites a day."[12] According to a statement of Dr. Netter,[13] some phthisical patients expel from their lungs in the course of a day as many as 720,000,000 bacilli.

It is fortunate for the human race that limitations are imposed upon the infectivity of the bacillus of tuberculosis and upon the chances of infection. Many tuberculous persons are not dangerous to their associates, for the reason that the bacilli remain within enclosed cavities, or are so discharged that there is no liability of entering other bodies through the usual portals. But among patients expectorating infection in plentiful quantities, the character of the patient increases or lessens the danger of infection. While the careless and dirty patient who spits upon the floor or into his handkerchief endangers all persons who are much with him, the presence of the cleanly person who is scrupulously careful in the disposal of his sputum may endanger not even his most intimate associates. And even with careless persons the intensity of infectiousness, or the concentration of infection, diminishes very rapidly with the increasing distance from the patient, even within the same house or room.

In the process of tubercular infection there are two contending factors which must be taken into account. One is the morbific capabilities of the slowly-developing tubercle bacillus. The opposing force in the struggle is the resisting power of the organism which is invaded—the power of the system to destroy the invading parasites and cast them forth. The infection of the living organism and the extension of the infection is not the mere implantation of germs in an indifferent culture medium; it is a struggle for supremacy between the invading parasites and their host. In the majority of cases, as pathological studies indicate, the infected human organism is victorious and rids itself of an incipient tuberculosis which is often never suspected.

The outcome of the struggle depends not alone upon the resisting powers of the person who has received the infection, but it is largely influenced by the quantity of infection received and by the virulence of the bacilli. Thus it is that the occasional visitor to an infectious patient is but little endangered, while there is much danger of the development of tuberculosis among his more constant associates. As to the virulence of the bacilli, investigation has shown that it is modified in various ways. It is intensified or lessened according to the media or host in which it had previously developed. It had diminished and finally destroyed with age and especially by the action of light, as has already been said.

(*To be continued.*)

[11] Congres pour l'Etude de la Tuberculose, 1888, page 306.

[12] Report. of Special Com. to N.Y. Legis., 1899, page 16. (Dr. Geo. W. Brush, Chr.)

[13] Revue de la Tuberculose, III., 35. 1895.

CORRESPONDENCE.

THE INSTITUTION OF CIVIL ENGINEERS.

(*To the Editor of* The Sanitary Record.)

Sir,—To prevent your general readers from assuming from the remarks of "Senex" that every candidate who passes the examination for election to associate membership into this Institution is eligible for election at once, I quote the following from the "Minutes of Proceedings of the Institution of Civil Engineers," viz., vol. cxxxi., page 10:—"It is to be borne in mind that the Institution examination for the class of associate member may be passed by a man before he is in a position by age or otherwise, to be actually a candidate for election."

I may say that there are many who have passed the examination and are qualified by age, but not otherwise, waiting for election.

With respect to restriction of membership, I beg to say that the total number of every class on the roll of the Institution on the 2nd of January, 1896 (the year previous to the examination referred to), was 6794. The total number on October 1st, 1900, was 7272.

I merely write this because I have a liking for your paper, and you always rectify any wrong impression you have given, consequently I thought that either "Senex" or yourself would do so in this case. I am caring for your readers; the Institution of Civil Engineers can care for itself.—Yours faithfully, O. J. K.

Batley, February 2nd.

Coming Municipal Men.

XIX.—MR. FRANK FOWLER,

Assistant Surveyor, Staines Rural District Council.

Mr. Frank Fowler, the subject of our present sketch, was born in Bedford, and educated in the Bedford Modern School. He served his articles under Mr. William H. Leete, A.M.I.C.E., M.S.I., M.I.C.E., &c., County Surveyor of Bedfordshire. At the expiration of his articles, Mr. Leete's two senior assistants having obtained appointments, he was selected to fill the office of chief assistant, which position he held for 2¼ years. The County of Bedford contains 138 parishes, comprised of three Municipal Boroughs, four urban districts, and seven rural districts. It is 31 miles long, 25 miles broad, has an area of 303,500 acres, and, according to the last census, a population of about 170,000. In the year 1894, there were about 400 miles of main roads under direct control, supervision, and maintenance, but at the present time that mileage reaches the considerable extent of 730 miles. The rateable value is £925,043, while the expenditure for the last few years has been between £40,000 and £50,000 per annum for improvements, maintenance, and repair. It will thus be seen that Mr. Fowler has had wide scope for practical works of many and varied types. During the 6¼ years he was at Bedford, he gained considerable experience with sewerage, drainage, building, road making, and other works. He assisted in preparing schemes for sewage works for the Dunstable Town Council, and the Trustees of the Three Counties Asylum, Arlesey; bridge works at Oakley, Potton, Flitwick, Leighton Buzzard, Barton, Radwell, Cardington, Harlington, Harrold, &c., and designing plans for Public Pleasure Ground at Bedford. In the extension of the Shire Hall, consisting of the enlargement of the Council Chamber, offices, and accommodation for the Inspector of Weights and Measures, and Secretary of the Technical Instruction Committee, he was also actively engaged, together with a new police-station and cookery school at Luton, a farm school at Ridgmont, and a store depôt building at Kempston, with accommodation for smithy, carpenters' shop, stables, and stores for four rollers, vans, carts, tools, &c.; this, in addition to drainage, fencing, paths, and other works in all parts of the county. He prepared three 2in. scale maps of the county, showing the different class of roads, railways, river, towns, villages, &c., also alterations of county boundary to date.

MR. FRANK FOWLER.

In July last year Mr. Fowler was appointed temporarily to the office of Assistant Surveyor to the Urban District Council of Sutton, Surrey, under Mr. C. Chambers Smith, C.E., M.S.I., where his knowledge of building superintendence was still further extended, as may be gathered from the fact that he was entrusted with the supervision of new buildings under the byelaws relating to new streets and buildings. He also had very useful experience under the Private Street Works Act as regards plans, estimates, provisional apportionments, &c. He moreover had the advantage of acquiring an insight into the working of the bacterial system of sewage treatment, and superintendence of extension work to fitters, &c., for which Sutton has by its successful treatment become world renowned. He has had, in addition to a practical experience, a thorough training in county and municipal office routine both at Bedford and Sutton. On the termination of his appointment at Sutton, he was selected and appointed Assistant Surveyor to the Staines Rural District Council, under Mr. Geo. W. Manning, C.E., Engineer and Surveyor, the position he now holds.

Health Matters in the City.—At a meeting of the Court of Common Council held last week, at the Guildhall, the Lord Mayor presiding, the Sanitary Committee reported that they had appointed Mr. Reginald Dudfield to act in the place of the late Medical Officer of Health, Dr. Sedgwick Saunders, for two months, pending the appointment of a successor, and recommended that it be referred back to them and to the Officers and Clerks Committee to consider the duties and emoluments of the positions which, in their opinion, should be held in future by different persons. This was agreed to. The Court discussed a report of the Streets Committee, recommending in regard to the street refuse of the City that the principle of barging dust and refuse into the country be adopted, and that they should be authorised to obtain a suitable site for the purpose. It was stated that the Corporation had to deal annually with 75,000 loads of refuse, of which 45,000 were already barged down the river. A letter was read from the Lambeth Borough Council, strongly objecting to the City's bringing into and shooting within another district their refuse matters. To this the committee had replied that they had instructed their Inspectors to see that such work was carried on with great care, and the offensive matters removed with due despatch. Mr. W. H. Williamson said that at Upchurch and other places on the Medway, to which dust and refuse was barged, diphtheria was very prevalent. There was the greatest difficulty in getting rid of the refuse and dust, and the only remedy was to burn it.

HOUSING OF THE POOR IN RURAL DISTRICTS.

A REPORT ADOPTED IN JULY LAST STILL INOPERATIVE, NO LAND BEING AVAILABLE.

The Annual Report of Dr. John C. Thresh, Medical Officer of Health for the Maldon Rural Sanitary District, &c., contains a report of two members of a Parliamentary Committee, appointed to hold a public inquiry at Bradwell-on-Sea into an application of the Maldon Rural District Council for permission to adopt Part III. of the "Housing of the Working Classes Act, 1890." The signatories to the Report remark that as the application is the first of its kind in the County of Essex, and any decision which the County Council might adopt would be likely to influence the conduct of other Rural District Councils within the county, they considered it right to make a full report, as there was little doubt that the conditions existing at Bradwell-on-Sea existed in many other places also.

The Report states:—

The inquiry was held in the elementary schools on Saturday, March 10th, and there was a good attendance of the larger ratepayers, including the rector, the County Councillor for the district, some of the Rural District Councillors, and some of the Parish Councillors, but the labouring class was almost unrepresented.

Prior to the opening of the inquiry we inspected a number of cottages under the guidance of Dr. Thresh, who is Medical Officer of Health for the district, as well as for the county. The first dwelling visited was a vile place—a wooden building, in wretched repair, having only two rooms (one upstairs and one down), no scullery of any sort, and no sink; with an open grate, without an oven, as the only cooking place; a small patch of garden and a privy completed the accommodation, for which 1s. 6d. weekly rent was being paid. The next cottage of similar construction, though scrupulously clean, was in even worse repair, the upper room being uninhabited; the widow occupying it had only made the lower room habitable by papering the walls to keep the wind and rain out. We visited other cottages, not so bad as these, but, nevertheless, much out of repair, which would have been condemned by Dr. Thresh, if there were any other place for the occupants to go to. We saw several others unoccupied, and more or less in ruins—their construction having been of the flimsiest character and repair out of the question.

A detailed description of every cottage in the parish, showing the accommodation, number of occupants, and its condition, was handed in at the inquiry by Dr. Thresh, and some further particulars concerning the unoccupied cottages have been furnished since at our request.

Plans for twelve cottages were submitted by the Surveyor, on behalf of the Maldon Rural District Council, and the approximate cost estimated at £2500, including the land, but no site has been determined upon. No exact estimate of the annual expenditure likely to be entailed by this scheme was submitted to us, but it was proposed to let the cottages at 3s. per week, and it was thought this would involve an annual loss of about £50. From calculations made by ourselves, however, we arrive at the conclusion that, with a rent as low as 3s. per week, the annual loss is likely to be even greater, and probably at least £80.

It was explained, on behalf of the Rural District Council, that it was doubtful if any higher rent than 3s. could be paid by any of the labouring class, and certain persons present urged that even this figure was too high, and that only 1s. 6d. per week could be paid.

This brings us to the crux of the whole difficulty. Nobody can build a decent cottage to let at 1s. 6d. per week. Many of the cottages attached to the farms, and let to the labourers employed thereon, are undoubtedly let at a rent much below their real value. One case of this sort came to our knowledge in detail during the course of the inquiry. Two cottages had been built by the landowners, for a farmer, at a cost of £400, the farmer paying them rent at 4 per cent. on the outlay, as well as paying rates and taxes, and keeping them in repair. We calculate that this involved him in an annual expenditure of about £22, equal to about 4s. 6d. per week for each cottage, but he only charged his men 1s. per week for each of them. In other words, the men's real wages were 3s. 6d. per week higher than their nominal figure, and he succeeded in retaining his men without appearing to break the local wages rate.

If the farmers would charge a rent representing the real value, and pay a proportionately higher wage, there might be some chance of private enterprise stepping in to provide the necessary cottages, but the present system destroys private enterprise, and if it be persisted in, the housing conditions in places like Bradwell must continue to grow worse, and the tendency towards the depopulation of the rural districts be increased.

On the other hand, if the Local Authority provide Housing accommodation for the agricultural labourers at rents suitable to their present wage, it must involve a heavy loss to the rates, the burden of which will fall, not merely on the owners and occupiers of the farms where the labourers work, but also on the professional man, the small shopkeeper, and others forming the general body of ratepayers in the district. In other words, farm labour will be subsidised at the public expense. But though this may form an argument for altering the incidence of the burden, its consideration does not help to meet the present difficulties, and the mere fact that the loss will fall on the general body will tend rather to retard necessary action by Public Authorities than to encourage rash speculation by them, and there appears, therefore, to be little reason to exercise a restraining influence, when such a case comes before us well supported by local opinion.

There can be no doubt that such exists in this district. The Parish Council of Bradwell are anxious for the adoption of the Act, and they are strongly supported by the rector, who is himself the owner of the living and a considerable ratepayer. The Rural District Council of Maldon have adopted the proposal, and are the applicants for the County Council's permission to move in it.

On the other hand, the farmers, with one exception, who spoke at the inquiry, were opposed to the scheme, apparently on two grounds, (*a*) that their men could not pay a rent of 3s. weekly, and (*b*) that any probable site was likely to be too distant from their own farms to be of use to their own men. One ratepayer objected *in toto*, declaring boldly that no more cottages were required, and that two of his own were empty. With regard to the assertion that more cottages are not required, we can hardly think that, if such were the case, the farmer already mentioned would have gone to so much expense to induce his landlords to erect two new cottages.

Some evidence was adduced to show that certain bargemen, earning better wages than the agricultural labourers, might probably be glad to take the proposed new cottages at rents involving the parish in a smaller loss than shown by the Surveyor's estimate, and that, in such case, the cottages now occupied by them would become available for other families earning less.

After carefully considering the whole of the facts, we are satisfied that the cottage accommodation in

Bradwell-on-Sea is inadequate, and that the conditions under which many of the labouring class are compelled to live are conducive neither to morality nor to good health.

In our opinion accommodation is necessary in Bradwell-on-Sea for the housing of the working classes, and there is no probability that such accommodation will be provided without the execution of Part III. of the Act; and having regard to the liability which will be incurred by the rates, it is, in our opinion, under all the circumstances, prudent for the said Maldon Rural District Council to undertake the provision of the said accommodation, and we recommend that the certificate asked for be granted accordingly.

We think the burden of the expenses should be borne by the contributory place of Bradwell-on-Sea as general expenses under the Public Health Acts, being satisfied that the circumstances of the contributory place and of the rest of the district render such limitation just.

We are of opinion, by reason of the date of the next ordinary election of members of the Maldon Rural District Council and otherwise, that Section 55 (1) (*a*) of the Act should not apply, and that the Rural District Council should be authorised to adopt Part III. of the Act forthwith as a case of emergency.

Dr. Thresh remarks:—"The report was adopted by the County Council on July 3rd. Upon receipt of this report the Bradwell Parish Council undertook to find a suitable plot of land for the erection of the cottages, but as yet they have been unsuccessful."

IS THE POPULATION OVER-ESTIMATED?

When Dr. Paine was Medical Officer of Cardiff, says a writer in the *Western Mail*, he expressed an opinion that if he lived long enough he would see the death-rate as low as 16 per 1000. That was a figure which he thought could not be reduced in any large town. Last year, however, the Cardiff death-rate, calculated upon the Registrar-General's return of population, was only 13·7 per 1000, the lowest, probably, in the whole of the United Kingdom for towns with over 150,000 inhabitants. It is no reflection upon Dr. Paine that he was unable to produce such results as his successor. In his days, sanitation had not reached the high standard which is now expected from corporate bodies. There were fewer Inspectors, there was no sanatorium, there was not the same control over the floating population, and the means adopted for isolating infectious diseases were of the crudest description.

In order to show the progress in the health of the town since the first returns of deaths were made, in 1845, the means of ten years will be the most representative. They average as follows:—

1845-54	...	annual death-rate per 1000	...	...	33·1
1855-64	...	,,	,,	...	26·5
1865-74	...	,,	,,	...	23·5
1875-84	...	,,	,,	...	20·0
1885-94	...	,,	,,	...	20·4

It will be seen that the last decade gives a slightly-increased rate over the preceding one, but since 1890 the figures have been exceptionally low, the returns reading as under:—

	Population.	Death-rate.
1890	117,012	21·1
1891	130,283	22·0
1892	136,181	18·7
1893	142,435	19·6
1894	148,890	16·2
1895	155,637	18·2
1896	162,690	16·8
1897	170,063	14·9
1898	177,770	14·8
1899	185,826	15·3
*1900	194,247	13·7

Nothing could be more satisfactory to the Cardiff Corporation Health Committee and the Medical Officer than the steady decrease in the death-rate, but what one naturally puts to himself is the question whether, in the first place, the estimated population is correct; and, secondly, whether there are not circumstances connected with a growing town like Cardiff which tend to reduce the death-rate. Taking the population first, the Registrar-General works out his increase on a system of logarithms based upon the previous ten years. He does not add a tenth for every twelve months succeeding the year in which the census is taken. That would certainly not prove correct, for the simple reason that there is an increase upon an increase, on precisely the same lines as compound interest must be worked out. The system, however, is like the laws of the Medes and Persians — unalterable — although the Local Authorities for at least three years have seen that the figures have been going awry. The Medical Officer (Dr. Walford) has excellent means of approximating the population by the number of inhabited houses. He must, however, be guided by the population per house as recorded in 1891, which worked out at 6·29. This is a rather high average, but, under the circumstances, it may be too low a figure. In 1898, when the colliers were on strike, the working men of Cardiff were placed in a dilemma from which it was difficult to escape. Many householders, after selling their furniture and other marketable articles, found it necessary to take apartments. Some have not been able yet to re-stock their houses, and for this reason the population per house may be greater than it was in the years 1881-91. Taking that as a basis, the Medical Officer (Dr. Walford) found that the Registrar-General began to go wrong in 1897, when he under-estimated the figures by 2050. Since that year the logarithm estimate has far exceeded that worked out from the number of inhabited houses, but even then the death-rate is not materially affected. The figures are:—

	Reg.-Gen.'s return.	Dr. Walford's estimate.
1897	170,063	... 172,113
1898	177,770	... 176,380
1899	185,826	 182,212
1900	194,247	... 185,037

The effect which the Medical Officer's estimate will have upon the death-rate during the last three years will be noticed from the following calculations:—

	Registrar-General. Per 1000.	Dr. Walford. Per 1000.
1898	14·7	... 14·8
1899	15·3	... 15·8
1900	13·7	... 14·4

The sum and substance of these calculations is that the death-rate of Cardiff for the past year should have been, if Dr. Walford's estimate of population is correct, 14·4 per 1000 instead of 13·7. In any case, the rate is as low as could be reasonably expected, and a great improvement upon Dr. Paine's cherished idea of 16 per 1000 inhabitants.

There are several reasons why the Cardiff death-rate should be low, independent of an over-estimated population. The progressive character of the town attracts a number of healthy young men and women who have passed the dangerous stages of infant life. What this means will be appreciated when we point out that in 1900 there were in the town 1314 deaths of persons under 5 years of age (52·78 per 1000 deaths), only 3·11 per 1000 between 5 and 15, and 3·97 per 1000 between 15 and 25. No large town which gains its natural growth of population as between births and deaths could expect such a low death-rate as one to which young people who have passed the dangerous infantile age swarm in order to obtain a living.

INSPECTION OF FOOD IN THE COUNTY OF LONDON.*

The food, other than uncooked butchers' meat, which was seized by the officers of the London Sanitary Authorities, consisted chiefly of fish, fruit, vegetables, eggs, poultry, condensed milk, and tinned foods. The reports show that such food was seized in Paddington, Fulham, Chelsea, Westminster, St. James, Westminster, Marylebone, St. Pancras, Hackney, St. Giles, Strand, Holborn, City, Shoreditch, Bethnal Green, Whitechapel, St. George-in-the-East, Limehouse, Mile End Old Town, Poplar, St. Saviour, Southwark, St. George-the-Martyr, Newington, St. Olave, Bermondsey, Rotherhithe, Battersea, Clapham, Wandsworth, Greenwich, and Deptford. In the City 750 tons of fish were condemned at or near Billingsgate. In the Strand district, in which Covent Garden market is situated, considerable quantities of fruit and vegetables were condemned, especially in the hot month of July.

Much attention has been recently directed to the sale of tinned food, and the fact was established during the year that a trade is carried on in which blown tins are punctured and afterwards sealed and labelled so as to make them resemble tins, the contents of which have not by change in condition brought about the blowing or bulging of the tins. The following extract from the annual report of the Medical Officer of Health of Limehouse is of interest in this connection:—

"On February 2nd, accompanied by the Inspector for the No. 3 district, I siezed a large number of tinned goods, lying at No. 3, Sage-street, Shadwell. Knowing that the owner, who was a wholesale merchant, had been previously prosecuted by a neighbouring Vestry, but had unfortunately been discharged, I decided that I should carefully sort each individual tin before proceeding before the magistrate to have them condemned. My plan was this, to divide a parcel of foods into four, allot one parcel to each of the three Sanitary Inspectors, and to sort the fourth myself. Then I carefully examined each tin that had been rejected by the Inspectors so that I could inform the magistrate that each tin which I had seized had been examined by me personally. They included 3971 tins of milk, salmon, sardines, soups, rabbits, compressed beef, vegetables, &c. It was proved conclusively at the Police-court that he was in the habit of buying rejected canned goods from importers for the purpose of feeding pigs. In fact, the invoices that were produced were marked 'pigs' food,' but he failed to show that he had ever sold a tin in his life for pigs' food. The tins, when the contents are bad, become bulged or blown from the formation of the gas produced during putrefaction. These tins were pricked to let out the gas, re-soldered, and fresh labels pasted over. The result was that the tins would appear good and would remain apparently good for two or three weeks. When I made the seizure, several men were employed putting on these labels. The case lasted five days, and Mr. Dickinson having found him guilty, sentenced him to five months' hard labour. It was a very severe sentence, but not too severe, considering the amount of injury the man could do and has undoubtedly done."

The Medical Officer of Health of Bethnal Green also reports that the Chief Inspector has found that an extensive trade is being carried on in unsound tinned provisions. He writes: "These usually are condemned stores disposed of by the owners, ostensibly for conversion into pig and poultry food. We have ascertained that articles of this nature are purchased by dealers who proceed to prick the bulged tins and re-solder them. The old label is then washed off and a new one pasted on. In this state they are disposed of to the keepers of small general shops, and to the manufacturers of cheap confectionery." The Chief Inspector states that unsound condensed milk is used for making caramels and caramel toffee. In connection with a seizure of unsound condensed milk to be used for such manufacture the owner was fined £25. The Inspector, referring to this case, writes: "Since then Inspectors Bridal and Mills, acting under my instructions, seized 125 tins of bad condensed milk at 58, Collingwood-street, and 83 tins of sardines at 71, Cambridge-road. At the time of writing two summonses in respect of these seizures are pending, and I will therefore only add that arising out of them Inspector Bridal proceeded to Islington, and gave such information to the officers of that Authority as resulted in their making a seizure of upwards of 2000 tins of blown sardines, salmon, condensed milk, &c., on the premises of a man who I have reason to believe has been largely engaged in trafficking in unsound foodstuffs of this description."

Inquiries were made by the Medical Officer of Health of Mile-end Old town at a large number of small general shops concerning the condition of tins of condensed milk. At the rear of one shop a quantity of such tins were found which were unfit for food. This milk was condensed, and it was then ascertained that the vendor of the milk lived in Poplar, and was carrying on a similar trade in that district, where he was prosecuted by and fined at the instance of the Local Authority.

In Poplar the Inspector seized seventy-one blown tins of condensed milk. The defendant's assistants admitted that the tins were deposited for the contents being used for the making of caramel toffee, and he was fined £20 with £10 10s. costs. The Medical Officer of Health, writing on this subject, says:—

"I suggested to the Sanitary Committee that it would be advisable to point out to the importers and the wholesale houses the desirability of having tins containing bad condensed milk destroyed altogether, or removed by the Local Authority as trade refuse (more especially as the importers and wholesale houses now pay to have it taken away) and then there would be no possibility of it being used as human food. I stated that it was manifestly wrong that the contents of tins which have practically been given away for pig-feeding or manure should again find their way into the market. It is not only detrimental to the public health, but it is bad from a monetary point of view as it must interfere with the trade of the shopkeepers, and it must also lessen the business of the wholesale houses and importers of condensed milk. The question was asked, Is such milk fit for pig-feeding? But the Public Health (London) Act, 1881, only relates to articles intended for the food of man. The Committee recommended that the various Sanitary Authorities in London be asked to communicate the suggestion to wholesale dealers in condensed milk in their districts.

"On another occasion I reported for the information of the Committee and general public, that it was rumoured that the contents of blown tins containing unwholesome condensed milk, since the recent prosecutions, are emptied into gallon jars, and thus supplied to dishonest pastry cooks, &c., the opening of such tins and the pouring into the jars took place near a pig-stye, as if for pig's food, in order to throw the officers of the Local Authorities off their guard."

Large seizures of tinned foods were made in some other districts. In Bermondsey, 181 cases of condensed milk, containing about 7000 tins, were condemned, the owner being fined £78. In Newington, 5664 tins of condensed milk were condemned; in St. George-in-the-East, three cases of condensed milk were condemned; in Wandsworth, 346 tins of condensed milk, 39 tins of lobster, and 25 tins of boiled rabbit were surrendered; in St. Saviour, Southwark, 400 tins of condensed milk were condemned; in St. Olave,

*From the last annual report of Dr. Shirley Murphy, Medical Officer of Health, London.

7 cwt. of tinned meat and 1 cwt. of condensed milk were surrendered; in Whitechapel, 94 tins of salmon and 28 tins of lobster were destroyed; in St. Pancras, 2112 tins of salmon and 36 tins of sardines were condemned; in Lambeth, 23 tins of lobster were seized, and the vendor fined £10.

From what has been said above it will be seen that there is a distinct trade in which unsound tinned food is prepared for human consumption, but the trade in food of this quality extends to other articles also. Inspections in Mile-end Old-town led to the discovery that a very similar course was adopted in dealing in eggs. The Medical Officer of Health states, that in the course of inspection of houses a large store was found and within an hour after the inspection application was made by the occupier for the removal and destruction as trade refuse of numerous eggs. The premises were then watched and in November were visited by the officers of the Sanitary Authority, who seized cases containing 3400 eggs which were subsequently condemned by the magistrate and the defendant fined £15, with £5 5s. costs. Dr. Taylor writes :—

"Inquiries were then instituted by your Inspector and myself in various parts of London with the result that we found that a very large trade was being carried on with this class of goods, particularly in the East-end amongst the lowest foreign shopkeepers. We also ascertained that the son of the defendant was employed by wholesale provision merchants to "candle" eggs (*i.e.*, to separate the good from the bad), and that he had been allowed to take the bad ones away. In other cases he had purchased eggs as waste at prices varying from 1s. to 1s. 6d. per 100, the price of good eggs at that time being from 7s. 6d. to 8s. per 100. Inquiries were made amongst the small provision merchants in St. George's and Whitechapel, and we discovered a number of them had purchased eggs from the defendant, and a large proportion of these eggs had been purchased by customers as good."

In July the Medical Officer of Health of Limehouse seized 117 tubs of unsound strawberries in two vans in Devonport-street, and took them before the magistrate at the Thames Police-court for condemnation. The magistrate refused to make an order, as no evidence was produced that they were exposed for sale at the time of the seizure, though they had been offered for sale and refused by a jam manufacturer in Ratcliffe half an hour previously. The owner admitted they were unsound, and afterwards made application for them to be destroyed as trade refuse. The Limehouse District Board applied for a mandamus to compel the magistrate to state a case on the ground that a condemnation order was a condition precedent to taking out a summons against the owner of the article, and that all the magistrate had to do upon the application for a condemnation order was to satisfy himself that the article in question was unfit for food of men, that it was not until a summons had been issued that he had jurisdiction to inquire whether the article was intended for the food of man or not; that this was a point of law, and the magistrate was bound to state a case for the opinion of the High Court upon it. The Divisional Court took this view.

The absence of any systematic inspection of meat in London gives abundant opportunity for unsound meat to be sold for human food. London receives from other parts of the country meat which cannot be sold locally on account of its condition, and there is, no doubt, a definite trade carried on in meat of a quality which would never knowingly be allowed to be used in any civilised community. Some time ago I had inquiry made concerning the business of a knacker in one of the provincial towns, with the result that it was found that the flesh of animals which had been sent there was removed to premises in a district in the east of London. The occupier of these premises dealt in cat's meat, but the fact that the flesh he received from the provincial town was dressed in the manner in which flesh is dressed for human consumption, strongly suggested the view that it was intended for this purpose. In 1899 the chief Sanitary Inspector of Bethnal-green kept watch over the London premises where this flesh was received, and ascertained that among the customers of the occupier of these premises was a "manufacturer of high-class meat pies." Having put himself in communication with the officers of other districts, to which this flesh was taken from these premises, a seizure of a portion was made in Hackney, where it was being removed to the premises of a sausage-maker. The flesh was unfit for food, and as the result of proceedings in the police-court the sausage-maker and the cat's-meat dealer were each fined £50. I have reported at length on the need for adoption in London of a system of meat inspection similar to that of many large foreign towns, and the subject still awaits the decision of the Council. Until such system is adopted there is not the least doubt that unsound meat will be freely introduced into London to the prejudice of the poor, who, more than any other class, must suffer from the present want of control over the meat supply.

Foreign meat entering London through the public slaughterhouses of Birkenhead and Deptford is subject to inspection at the time of slaughter, and that which is received into the Smithfield market of the Corporation is also subject to inspection. In 1899 the Medical Officer of Health of the City reports 405,406 tons of meat entered these markets, and 1172 tons were destroyed, of which 1034½ tons were putrid, 95 tons were diseased, and 42½ tons unsound from accident or other causes. Dr. Saunders says of "wasted" Australian sheep many were condemned, and that some of them, though not absolutely injurious as food, were almost destitute of nutritive property. In St. Saviour, Southwark, as many as 1520 carcases of frozen sheep were destroyed, but in the reports relating to the other districts no reference is made to seizure of foreign meat arriving dead in England.

The only other districts in which any considerable seizures were made were Holborn and Islington. In Holborn, where a large meat trade is carried on in shops situated in streets bordering on the City markets, and where a special Meat Inspector is employed, 3390 stone of meat were seized, 888 stone of which were diseased and 3101 decomposed. In Islington, where also a special Meat Inspector is employed, 8014 lb. of meat in slaughter-houses and 1439 lb. of meat in shops were destroyed. The appointment of special Meat Inspectors throughout London is much needed, and especially in districts where the population is poor and low-priced meat is sold.

The Edinburgh and District Water Trust has, on the recommendation of its Works Committee, resolved to make application for an extension of time in which to complete the Yalla Waterworks. Under the Act sanctioning the Yalla scheme ten years were given in which to complete the works. So anxious had the Trustees been that this great work should be proceeded with with vigour, that they gave a bonus of £15,000 to one set of contractors. The work went on pretty well for two years, but afterwards, owing to various circumstances, the contractors were unable to proceed further. Six years will have elapsed by May 30th next, and the Works Committee are informed that scarely one-fourth of the work has been completed. Under these circumstances the Trustees are obliged to apply for an extension of time, and in the Provisional Order to be presented under the Private Legislations Procedure (Scotland) Act, they ask for five years in which to complete the works.

EXAMINATION RESULTS.

THE SANITARY INSTITUTE.

At an examination in Practical Sanitary Science, held at Bristol on January 25th and 26th, 1901, three candidates presented themselves. The following two candidates were awarded certificates:—Walter Stanley Bracher and William Osborn Thorp.

For Inspectors of Nuisances eighteen candidates presented themselves. The following twelve candidates were certified as regards their sanitary knowledge, competent to discharge the duties of Inspectors of Nuisances under the Public Health Act, 1875:—Herbert Arnold, George Bidwell, Frederick James Brown, Edward Carter, William Derham Carter, Alfred Chant, William Henry Greenep, Edward John Ley, Albert Ernest Parker, Robert John Alexander Stuart, David Thomas, Joseph William Tibbitts.

SANITARY INSPECTORS' EXAMINATION BOARD.

At an examination for Sanitary Inspectors under the Public Health (London) Act, 1891, held last month in connection with the above, the following candidates were successful. The names of the Institutions at which the candidates received instruction are appended.

Miss G. D. Bevan (National Health Society), Miss I. W. Cox (National Health Society), Mr. V. E. F. Donnewald (Sanitary Institute), Mr. A. Griffiths (Sanitary Institute), Mr. R. E. James (King's College), Miss G. A. Looker (National Health Society), Mr. C. W. Rudd (King's College), Miss L. L. Spiller (National Health Society), Mr. A. H. Walker (King's College), Mr. A. Wheaton (King's College).

ROYAL INSTITUTE OF PUBLIC HEALTH.

THE COMING CONGRESS AT EASTBOURNE.

Convened and presided over by the Mayor (Alderman H. W. Keay, J.P.), a meeting was recently held at the Town Hall to elect committees to arrange for the meeting of the Congress of the Royal Institute of Public Health at Eastbourne next July.

The Duke of Devonshire will act as president of the Congress, and his Grace and the Duchess will dispense their hospitality on a princely scale. Through the kind offices of the Hon. Mrs. Freeman-Thomas, Lord Brassey has promised to entertain the members of the Congress at Normanhurst.

The Mayor opened the proceedings, pointing out the advantages to the town of such a Congress, with a special allusion to the kindness of the Duke of Devonshire, who had promised to do all he could to render the visit a success.

Alderman Strange also referred to the immense benefit the Congress would be to the town, and moved the following resolution:—"That the Mayor (Mr. Alderman Keay, J.P.) be appointed honorary president of the Congress of the Royal Institute of Public Health, to be held at Eastbourne this year; that the Town Clerk (Mr. H. W. Fovargue) and Medical Officer of Health (Dr. W. G. Willoughby) be appointed joint honorary secretaries; that the Borough Accountant (Mr. John Allcock) be appointed treasurer; and that the foregoing be *ex officio* members of each of the committees appointed."

Colonel Shaw seconded, and the motion was carried.

Dr. James Adams moved:—That the following be appointed the Executive Committee (with power to add to their number) to arrange the places and times of meetings, and to carry out such other duties connected with the Congress as do not appertain to any other committee appointed, viz.: Mr. E. L. Beckwith, Rev. E. L. Browne, Mr. J. P. Cockerell, Rev. Dr. Crowden, Mr. Alderman Duke, Mr. R. M. Gloyne, Dr. Habgood, Mr. Councillor Harding, Mr. F. Hollins, Mr. Councillor Martin, Mr. Councillor Maude, Mr. A. Mayhewe, Major Molineux, Mr. Councillor Rowe, Mr. Councillor Sharpe, Mr. Councillor Sherwood, Mr. Alderman Strange, and Mr. Councillor Wright.

The Rev. Canon Goodwyn seconded, and the motion was carried.

Mr. Arthur Dilks moved that the following be appointed the Reception and Hospitalities Committee, viz.:—Mr. Councillor Breach, Mr. W. Bruford, Mr. Alderman Burt, Colonel Cardwell, Mr. J. P. Cockerell, Mr. Councillor Eden, Mr. Alderman Farncombe, Colonel FitzGerald, Mr. Freeman-Thomas, M.P.; Dr. H. S. Gabbett, Rev. R. C. Gillie, Rev. Canon Goodwyn, Mr. Lindsay Hogg, M.P.; Mr. Councillor Simmons, Mr. Councillor Steward, Mr. Alderman Sutton, Captain Tuckett, Mr. Councillor Welch, Mr. A. J. Howard, Dr. Hayman, Mr. Aden Beresford, Mr. Thomson, and Mr. Colville.

Alderman Strange seconded the motion, which was agreed to.

On the motion of Councillor Dr. Sherwood, it was resolved:—That the following be appointed the Entertainments and Excursions Committee, viz.: Dr. Adams, Mr. Milton Bode, Mr. Councillor Bradford, Mr. J. P. Cockerell, Mr. Councillor Easter, Mr. Ewart, Mr. J. C. Foran, Dr. Kenneth Fraser, Mr. Councillor Hillman, Mr. Councillor Lambert, Mr. F. Lawson Lewis, Dr. MacQueen, Mr. Alderman Skinner, Mr. A. Standen Triggs, Mr. H. M. Whitley, Mr. Percy Wehner, Mr. Leatham, Dr. Merry, Mr. Jaffé, Mr. Herbert Elliott, Mr. Durlacher.

Colonel Shaw moved:—That the following be appointed the Finance Committee: Major H. P. Molineux, Mr. Councillor Simmons, Mr. Alderman Sutton, Mr. A. H. Thomas, Mr. Councillor Towner, Mr. E. E. Pratt, Dr. Bransby Roberts, Mr. Dilks, and Mr. Councillor Maude.

Colonel FitzGerald seconded, and the motion was agreed to.

On the motion of Councillor Maude, seconded by Mr. Standen Triggs, it was resolved that the gentlemen present should send in the names of suitable ladies willing to act on the Committee.

The discussion of financial arrangements concluded the meeting.

That excellent body, says the *Pall Mall Gazette*, the Coal Smoke Abatement Society, of which Sir W. B. Richmond is president, has addressed a letter to the London School Board urging it to look after its grates and stoves. A good example set by so influential an institution would, in the opinion of the C.S.A.S., have a most salutary effect. The suggestion is, therefore, that when occasion arises the Board should specify some form of apparatus that will materially reduce the evil of imperfect combustion. The Board might possibly retort that the C.S.A.S. should give point to its gentle admonition by mentioning some particular stove or stoves; but that would be considered advertisement, perhaps. The Coal Smoke Abatement Society has, at any rate, justified its existence by jogging up the School Board and other public organisations, which, as it cautiously reminds them, are amenable to the law for allowing their chimneys to emit a black and evil-smelling cloud. Its crusade against domestic chimneys is a more difficult undertaking, and its falls back upon that vague phrase, "the gradual education of public opinion." Very gradual, we fear.

THE HEALTH OF BIRMINGHAM IN 1900.

At the meeting of the Birmingham City Council on Tuesday, the Health Committee reported on the health of the city. The birth-rate for the year 1900 was 32·7 per 1000. This is a lower birth-rate than was recorded in 1897, 1898, and 1899, but a little higher than in 1893, 1894, 1895, and 1896. The death-rate was 21 per 1000, against 21·1, 19·5, and 20·5 in 1897, 1898, and 1899 respectively, and against an average of 20·4 in the previous ten years. The mortality in the first and second quarters was very high for the time of year; in the other two quarters the mortality was unusually low, with the result that the figure for the whole year is far more satisfactory than it promised to be during the first half of the year. The high mortality in the first two quarters was occasioned principally by influenza, bronchitis, and pneumonia. The zymotic death-rate was 2·7 per 1000, or 0·5 below the average in the previous five years. The deaths from measles numbered 130, or 117 below the average in the five previous years. Scarlet fever caused 2063 cases and 93 deaths. In the five previous years the average number of cases was a little higher, viz., 2171; while the deaths were almost identical in number, amounting to 92. Of the 2063 cases notified, 1827 were treated at the City Hospital.

It is pleasing to report a very large reduction in the prevalence and fatality of diphtheria, the cases falling from an average of 811 in the five previous years to 542 last year, and the deaths falling from an average of 189 to 77 last year. It is also gratifying to find that the case-mortality of this disease was very much lower than usual; only 14 per cent. of the cases proved fatal, while in previous years the mortality had ranged from 19 to 29 per cent. Whooping-cough caused 301 deaths against an average of 242 in the five previous years. The most unsatisfactory feature in the records for the year is the extensive prevalence and high mortality from typhoid fever. This disease was notified in 853 cases, against an average of 574 in the five previous years, and resulted in 179 deaths, against an average of 102. In spite of the very hot weather experienced in July, the mortality from diarrhœa was lower than usual, the deaths numbering 613, against an average of 723 in the five previous years. During the year 848 bacteriological examinations were made at the University of Birmingham, under the agreement with the Committee, in connection with diphtheria cases; 455 of the examinations made were on behalf of the Blue Coat School, where an outbreak of diphtheria occurred in the fourth quarter of the year. Three hundred and twenty-eight doses of anti-toxin were issued, two doses as a rule being sent to one patient, and the Committee believe that the very gratifying decline in the death-rate from diphtheria is due to some extent to the facilities provided by them for the anti-toxic treatment of the disease.

The erection of the new hospital in Yardley-road, which was approved by the Council in July last, is being proceeded with as quickly as possible, and immediately the new hospital is ready for the reception of any isolated case of small-pox that may occur in the city, the Committee will feel free to utilise the Little Bromwich Hospital for the reception of typhoid cases. In the meantime, as an aid towards combating the disease, they have arranged with the University of Birmingham for Widal's test to be carried out, free of charge, for patients within the city. During the year 17,832 primary visits were paid by the Women Health Inspectors, and 3929 revisits to houses needing further attention. At about 5000 houses there was sickness of some kind, and in many cases the visitors gave advice as to nursing the patients.

Under the Housing of the Working Classes, 1890, five houses have been closed, and nineteen put into habitable condition, in addition to eighty-eight closed and thirty-four demolished under the Public Health Act, 1875. The Committee also report the purchase of about 17½ acres of land lying between Bordesley Green-road and Yardley-road for the erection of working-class dwellings. The preparation of a scheme for the laying out of the land and the erection of dwellings thereon is receiving their attention.

National Health Society.

OFFICIAL TRANSACTIONS.

It is with much satisfaction that we record the success of the National Health Society's students in the recent examination held by the Sanitary Inspectors' Examination Board. Of the candidates who presented themselves for this examination after attending the Special Lectures held by the Society, not one failed to obtain the certificate of the Board. This is a great encouragement to the committee and lecturers of the Society, who spare no trouble in the arrangement of the lectures and in the individual care and teaching given to each student. The names of the successful candidates are as follows: — Miss Georgina Bevan, Miss Irene Cox, Miss Grace Looker, Miss Lucy Spiller.

In case any ladies would care to take advantage of the next examination of the Sanitary Inspectors' Board, which will be held in May, we beg to remind them that the Society is now holding another course of training lectures. Students for this course can still be received, though no time should be lost in applying to the secretary.

Elementary Examinations.—Examinations on Nursing and First Aid have recently been held in five centres in the rural districts of Lincolnshire. Seventy candidates presented themselves in all, and of these, seven only failed to reach the required standard. The majority of these candidates are drawn entirely from the working classes, which is a great satisfaction to the Society, the primary object of the teaching given by its lady lecturers in the "Homely Talks" being to reach the uneducated and labouring classes. The examiner particularly mentions one centre as being a "model class—nearly all labourers' wives."

Readers are reminded that a course of lectures on "First Aid," by J. Cantlie, M.A., M.B., F.R.C.S., is now in progress at 53, Berners-street, on Monday afternoons at 3 p.m. The subject of the lecture on Monday next, February 11th, will be "Fractures."

The following extract from the *Bradford Observer* will be read with interest by Miss Alice Ravenhill's many friends. Miss Ravenhill, it will be remembered, is working as Inspector under the Yorkshire County Councils. Commenting on the various schemes put forward by the Technical Instruction Committee of the West Riding County Council, the *Observer* remarks, "Attention having been drawn to marked advances made in the teaching of hygiene and domestic economy in America, Miss Ravenhill, who is conducting training classes for teachers in these subjects in the West Riding, is to visit the United States and report upon the methods adopted there. The Board of Education and the Sanitary Institute will combine with the West Riding County Council in making grants towards Miss Ravenhill's expenses." This is a wise step on the part of these public bodies, who are to be congratulated on their choice of a "commissioner," and the results of Miss Ravenhill's observations will be looked for with much interest.

NOTICES.

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FEBRUARY 7, 1901.

THE CLEANSING OF STREETS.

THE need for a more effective system of street cleansing has been forcibly impressed upon the public—in London, at all events—during the past few weeks. While agreeing in the main with our contemporary, the *Lancet*. that mud may, in many respects, be preferable to dust particles, we would infinitely prefer to see its more effectual displacement, and dispense with a blessing which, in our opinion, is very much in disguise. Effective mechanical appliances for street-cleansing purposes are, as yet, in their infancy; but we are not without hope that some system may yet be devised that will do away with a state of things which has become a scandal to, and an unedifying comment on, our vaunted civilisation. As it has been pointed out, the problem still awaiting solution is not to make clear pathways through the streets, but to clear the whole thoroughfare from pavement to pavement. So far, no means of doing this exists; the mud is simply chevied, as it were, from pillar to post. The consequence is that the foot-passenger, in seeking to avoid it in one direction, plunges into a worse quagmire in another. This condition was made painfully evident during the recent snowfalls, when it was further aggravated by the unfortunate condition of most of the principal thoroughfares. Why this particular season of the year should be chosen for the carrying out of this work is one of those anomalies in Local Government which passes understanding. In January, above all other months, it is reasonable to expect a preponderance of both snow and mud, and yet this very period is chosen as the most propitious for a universal upheaval of the streets. The difficulty of cleansing is thus aggravated beyond measure, for no machine, however well devised, could hope to grapple with thoroughfares blocked from end to end with trenches, and obstructed at all points by the *débris* extracted therefrom. Although this is only a side issue of the main question, it is a very important one; but admittedly the first thing is to determine what is the most ready and effective method of cleansing the streets under normal conditions.

The removal of snow by means of salt, which the City Authorities resort to, has been characterised as "brutal but effective." The brutality comes in where the horrible mixture is allowed, as was the case recently, to lie undisturbed for hours, and to become a serious menace to the health of pedestrians. The City Authorities are delightfully economical in this matter. They are apparently under the impression that it would be a waste of salt to remove the slush until the snow ceases. But the use of salt, which has admittedly something in its favour, should be carried out under proper conditions, and until such is the case this practice must be condemned as derogatory and indefensible.

It is quite evident that proper methods of handling snow as well as mud in our streets have yet to be evolved, and whoever is successful in finding a way out of the difficulty will gain the gratitude not only of all who have had to pass through the slough of despond in London during the past month or so, but of all who are concerned in the comfort of pedestrians in large cities the world over. The "perils" of the streets under ordinary conditions are quite plentiful enough, and when to these are added the choice of being immolated in filth or permanently disabled in health through contact with a mixture of salt and snow, we think it quite time a dictator arose

in our midst to teach our City Authorities their duty. Pending the discovery of adequate mechanical means, there is always at hand the "unemployed," only too ready for a casual job, and a more effective organisation in this direction would appear to be sadly needed. Promptitude in getting them to work would also do much to alleviate the inconvenience referred to, while for the policy of parsimony that is content to put a man here and there where fifty men are needed, there is no excuse whatever. If the provinces have anything to teach London in this matter, we hope they will come forward at the earliest possible opportunity, and we shall only be too pleased to give the methods publicity in our columns. It is, indeed, a melancholy fact that the lesson has yet to be taught.

The Treatment of Inebriates.

Medical Officers of Health, quite as much as those serving under Poor Law Unions, are anxious for some effective means to be devised for dealing with the terrible disease of inebriety which has unquestionably increased in recent years. We do not refer so much to what is called the criminal classes, but to those who are regarded as respectable and well-to-do members of the community. The causes for this are various—our national prosperity for one thing; but if the secret history of many a family could be laid open we think that the grocers' licence would have to bear a greater share of the responsibility than anything else. Many a home has been darkened through its instrumentality, and many a woman has been changed from a good housewife into little better than a drivelling idiot. It is for this class that something more must be done than was provided in the Act of two years ago. If doctors would but certify that such persons were not responsible for their actions, that they were a danger to themselves as well as to the community, then some advance might be made in stamping out the disease. Even with the thoroughly depraved and criminal inebriates the present Act can do but little. In a brief report on its working, prepared by Dr. Wynn Westcott, it is shown that during the first year's operations only eighty-two patients were received into homes—and what are these among the thousands of admittedly habitual drunkards in the United Kingdom? The work is so important that those County Councils willing to provide institutions under the Act should receive substantial help from the public funds. If this could be promised greater progress would soon be made, and an important step taken to secure a further diminution in the death-rate. One other reference in Dr. Westcott's report is of interest. Acting on the experience of the past, he foreshadows what he considers are the qualifications necessary in the officers of inebriate homes. "In all cases," he says, "we think the superintendent of the institution should be a physician and not a civilian, and he should be a doctor who has an enthusiasm for the work of curing inebriety. He should be an abstainer, and so should all his officers. The home should be in the country as far as possible from towns, to avoid the risks of drinking by the straying away of patients, and so as to provide ample agricultural and gardening work. Regular and suitable labour, and regular but varied amusements should be provided. The system of preserving good order by the bestowal of rewards is to be preferred to that of punishment for errors. The culture of the patients by a well-considered moral code will be a necessary feature of the successful mode of cure. The separation of the sexes will be necessary, but there might well be two adjacent homes, one for each sex, by which means the agricultural work of one might supplement the laundry and clothing work of the other. Small dormitories should be preferred to large wards. The mental and moral standing of the nurses and attendants should be a matter of careful selection. Lastly, these homes should be self-supporting colonies, devoted to self-improvement by means of pure air, exercise, regular work, sufficient play, good food, and healthy dwellings."

An Injudicious M.O.H.

In the last issue of *Truth* a very extraordinary letter is published. It was written by Dr. G. Vawdrey, Medical Officer of Health at Farnborough, who certainly appears to have forgotten the dignity due to his profession and office. It would appear that there is a general understanding between Army Medical Officers at Aldershot and the surrounding localities that cases of infectious disease should be notified to each other, and Surgeon-General O'Dwyer wrote to the Farnborough Council complaining that this agreement had not been carried out by Dr. Vawdrey. The latter was asked by his Council to explain, and did so in the following epistle:—"My observations on the enclosed letters of the Principal Medical Officer and the Assistant-Adjutant-General are:—(1) That as a specimen of Christmas senile buffoonery they are poor; (2) as a parody on the story of the monkey, the cat, and the chestnuts, they are transparent; (3) that the British taxpayer should pay these highly-salaried officials to perpetrate such trash is a scandal. And now for facts. Inter-notification of infectious diseases is not a duty, but essentially an act of grace, and entirely at my discretion as to what districts I notify. As a matter of fact, half an hour after I received the notification I notified, as an act of courtesy, Surgeon-Colonel Ruttledge, the Medical Officer of Health for North Camp, and the Inspector sent the letter. With the Principal Medical Officer I have, and I mean to have, nothing to do. Were it otherwise I should congratulate him on his lucky escape from a more severe punishment than exposure for his part in the late Ballahooley-Bumbledom scandal. Trying to twist the tail of the Medical Officer of Health for Farnborough is sure to be amusing, and may be instructive. Further attempts are invited." This style of official correspondence is happily rare, for it reflects no credit on its author. The health of so vast a body of men such as is gathered at Aldershot is a great responsibility, and we can

well understand the anxiety of Dr. O'Dwyer when he found out that infectious disease was in an adjoining district. It would appear that some personal jealousy or feeling exists between the two medical men; but this is no excuse for the writing of such epistles to a public body. The first qualification for a Medical Officer of Health—and, indeed for all public officers—is that he should be a gentleman, and when he ceases to act as one he shows himself unfitted for the position he occupies. Dr. Vawdrey's effusion is neither funny nor clever, and the sooner he realises this the better. If he is devoid of respect for himself, at least he might have some for the profession of which he is an honourable member.

Municipal Bakeries.

The craze for municipalisation appears to have no ending in some quarters. One of the latest fads is to establish municipal bakeries. A tract on this subject has been issued by the Fabian Society which is an illustration of how one-sided statements are put forward as proving the wisdom of certain pet proposals. A large proportion of the tract is taken from reports prepared by Drs. Waldo and Walsh, and other medical officers. They describe the horrors of the underground bakehouse, and set forth the need of reformation. With all this we thoroughly agree; but it is when the writer goes on to consider remedies that we join issue with him. To argue that because "bread is already made by several public institutions" at a comparatively small cost, therefore the municipality could supply it cheaper to the public than the baker, is very poor logic indeed. In reckoning the cost of producing bread at asylums, it would be interesting to know how much is charged for interest on capital expended in the provision of buildings and plant, how much is allowed for wear and tear of machinery, and the many other things which an ordinary business is called upon to bear before the cost of production is arrived at. Without this being done such figures are altogether fallacious and misleading. Again, there is no analogy between the supply of water, gas, or trams, and that of bread. Private enterprise can better meet the public needs in providing the latter, and we deny that there is any general demand for a change. What is needed is set forth by Dr. Waldo in his well-known book. Let us have medical inspection and registration before occupancy; uniform regulations made by a central Authority, such as the London County Council, and enforced by the Borough Councils; and the total abolition of cellar bakehouses. With these reforms properly carried out there would be but little ground for complaint, and certainly no need for enlarging the scope of municipal trading.

Birmingham Health Department.

The great Midland city has long had the character of being progressive in its sanitary administration, and also for a ready acknowledgment of the value of services rendered by its officers. Last Tuesday the City Council was invited to sustain this reputation by advancing the salaries of two of its officers. The Health Committee recommended that Mr. William Holt, superintendent of the interception department, receive an increase of £50 per annum, bringing his salary up to £500. This is by no means a princely remuneration to one who has charge of six large wharves, giving employment to 550 men. During Mr. Holt's ten years' tenure of office there has been a large increase in work of his department; but his inventive ingenuity has effected many improvements in the refuse destruction machinery of the Corporation, by which means greater efficiency has been secured. The other officer recommended for increased salary was Mr. John Parker, Inspector of Nuisances. Fifty pounds additional was also recommended in this case, bringing the total up to £400 per annum. Even this is little enough for the head of such an important department. Each year the work of a Sanitary Inspector becomes more arduous, and, whilst it may be perfectly true that he acts chiefly under the supervision of the Medical Officer of Health, it must not be forgotten that he has to make himself thoroughly conversant with the intricacies of many important Acts of Parliament, as well as take action at times in many delicate cases. In large cities and towns the head Sanitary Inspector has a very responsible position, and should be much better paid than is usually the case.

An Old Proverb Discredited.

The old proverb says that a green Yule makes a fat churchyard. It may be taken as representing the general belief of mankind. The origin of the belief can probably be traced to two sources—partly to the common feeling natural to healthy, well-clad, well-nourished people that a dry bracing atmosphere such as accompanies frosty weather is more invigorating than the mild damp weather that usually distinguishes an open winter; and partly to the idea that because frost and snow in winter are natural and seasonable, they must be more healthy than an unseasonable mildness of temperature, with storms of wind and rain. But whatever may be the causes of the belief, there is no doubt that it is not borne out by the statistics of the Registrar-General. A writer in the *Scotsman* has been at pains to analyse the returns for the winter months from 1881 to 1898, and the result is conclusively to show that "mild winters, however stormy and wet they may be, are not marked with increase in mortality-rate, rather, indeed, by fewer deaths; and that the good old-fashioned severe winters not only cause an increased mortality from diseases, such as those of the respiratory organs, which are especially liable to be initiated by cold, but also from most other possible causes, seldom connected with the evil effects of cold in the public mind." The period embraced contained five exceptionally cold spells, comprising in all twenty-one months, with an average decrease in mean temperature per month of 3·01 deg. Fah., and the total death-rate was 14·48

per 10,000 higher than the mean—11·77 being attributable to deaths from lung diseases, 0·76 to deaths from heart affections, and the rest to other causes. On the other hand, five warm spells, including twenty-two months, were recorded, with a mean excess of 2·86 deg. Fah. above the normal, and the total death-rate for this period was 13·58 per 10,000 below the mean, of which the decrease in deaths from respiratory diseases was 11·97. The writer follows out his investigation in great detail, examining the death-rates for various winters, and the effects of the rise and fall in the temperature on the deaths from the various causes of disease—pulmonary, nervous, heart, and digestive diseases. The conclusion reached by a study of the official records is that the popular belief is a fallacy, that abnormally cold periods in the winter and early spring months cause an increase in the total mortality—at least in the larger towns—and that this is especially the case with regard to the old and feeble and the very young, and those who are insufficiently nourished. The increase is most marked in connection with lung disorders, but the proportional rate is higher from almost all other causes, except from zymotic diseases, the mortality trom which varies, of course, with their incidence in epidemic form. It is to be noted, however, that "the rise in the death-rate, especially from heart, nervous, and consumptive causes, is often not so great at the time as some little time after the cold spell has been in progress or has ceased."

Japan Leads the Way.

In the January number of *Scribner's Magazine* there is an instructive article by Mr. Thomas F. Millard, which shows that in some departments at least of sanitation the Japanese are bidding fair to out-distance the nations of the West who boast an older civilisation and serve as models for the Japs. Mr. Millard accompanied the Allied forces in the march on Pekin, and he writes with the authority of one who has had a wide experience of campaigning. It is not our province to follow him in his observations on the superiority of the Japanese troops in point of military equipment, but we are interested in his remarks on their field medical corps organisation. It was far superior, in his judgment, even to that of the Indian corps, which is generally reputed the most efficient possible. The Japanese field hospitals lacked nothing required by British or German standards. They alone in the Allied Army were plentifully supplied with ice, which was a most necessary adjunct in a march in which hundreds of men were daily prostrated by the heat. In the heat encountered on the march, the water-supply was an all-important consideration, for it was impossible for the troops to drink from the Chinese waterways, which are simply open sewers. Though this difficulty was foreseen before the commencement of the campaign, the Japanese was the only division of the Army adequately provided for it. They alone of all the troops carried portable filters for use in the field, their water was generally aërated, and for the officers and wounded there was a plentiful supply of bottled mineral water. All these points, in addition to the natural advantages enjoyed by the Japanese in their capacity to stand the climate, told in their favour to such an extent that on reaching Pekin only 5 per cent. of their men were unfit for duty, while 33 per cent. of the Americans were in hospital. The progressiveness and aptitude to learn of this remarkable little nation are truly making them in every department the wonder of the West.

Small-pox Ravages in Glasgow.

The prevalence of the epidemic of small-pox in Glasgow is causing the Sanitary Department considerable uneasiness. It has assumed most alarming proportions, and though meantime confined to the Eastern districts of the city, the habitation of the poorer classes, there are indications that it is about to extend to other districts. A recent diminution in the number of admissions to hospital encouraged the Sanitary Authorities to believe that the epidemic was on the wane, but their anxiety shows as yet little abatement, and they are putting forth the most strenuous efforts to cope with the disease. Dr. Chalmers, the Medical Officer of Health, in a circular to all the medical practitioners in the city, describes the present outbreak as the most severe which has been experienced since 1873. He has issued a window-card to the profession, bearing the words, "Free re-vaccination within," the doctors having been authorised to re-vaccinate all who may apply to them. The Health Committee have further authorised doctors to go to the public warehouses to offer to vaccinate the employés, and the police clerk has also issued a circular urging on the citizens the necessity of immediate re-vaccination. Very few young children have suffered from the epidemic, as the recent date of their vaccination has protected them from infection. Last summer the Health Authorities had reason to complain of the indifferent response their offers of re-vaccination met with; but there is no complaint of indifference now, for the public is, on the contrary, thoroughly alarmed, and there is difficulty in satisfying the demand for re-vaccination with the amount of lymph at present at the disposal of the Corporation.

MUNICIPAL ENGINEERING & SURVEYING.

CROSS-TABLE CHAT.

It may be taken for granted, whatever enthusiasts—infatuated by some pet scheme—may say to the contrary, that so long as covered sewers exist for the conveyance of sewage so long will the so-called "sewer-gas" trouble exist. Effete organic matter of which sewage is composed cannot be prevented—except at an inordinate and extravagant cost in disinfection—from putrefying and becoming malodorous. Engineers may by the construction of self-cleansing sewers, by regular flushing, and the provision of proper means of ventilation, reduce the generation, and also the offensiveness of sewer gas to a minimum, but a complete "remedy"

is as impossible as the successful discovery of "perpetual motion," or the resuscitation of the Dodo.

THE present trend of opinion among municipal engineers of experience is decidedly in favour of closing all street-surface manhole covers and substituting tall ventilating shafts. The distance apart of such shafts has been capriciously fixed at 120 yards, and the area of such shafts to be not less than 28·27in., which represents the sectional area of a 6in. circular pipe. There does not appear to be any basis established to assist the engineer in determining the relationship which should subsist between the volume of sewer gas or diameter of the sewer, and the number and sectional area of ventilators to be provided. Whether this is such a mode of deduction which is consonant with the profession of engineers is a matter on which there must be considerable doubt. It has, however, been found in practice by a number of engineers that this empirical rule is convenient. There is no evidence that it is a proper one, or that double this number of ventilators would be more suitable. Sufficient, however, for their purpose is it for copyists to follow the lead given by others, and I doubt not that the method will prevail so long as there is no absolute proof of its insufficiency or it is prohibited, as regards new schemes, by the Local Government Board.

THERE are, however, some earnest sanitarians who urge against ventilation by tall shafts that the liberation of sewer gas around the roofs of houses is dangerous, and that the prevalence of infectious disease is directly or indirectly caused by such a system. Unfortunately, opinions of adherents to each system are not supported by any facts or investigations which can carry weight with the impartial. And it is just this absence of accurate investigation and experiment which is wanting.

THE subject is one which demands the most careful study of engineers and medical men who are trained to accuracy of observation and deduction, and experiments should be conducted on the lines which I have indicated, either by engineers and medical men working for their own Authorities, or by some responsible body such as the Sanitary Institute, or the Municipal Engineers' Association, or by such Authorities as the County Councils of London or our larger cities, and it is earnestly to be hoped that these will be carried out.

CORRELATED with the subject is the ventilation of house drains. It has become with some engineers a crotchet to decry the necessity of intercepting traps on house drains, and to advocate the free ventilation of sewers by means of private drains. The chief arguments of this new school are that the intercepting trap is a minature cesspool, and that if it be abolished the sewers can be effectually ventilated by means of the house drains alone. The former argument is deserving of the same consideration that should be given to a proposal to abolish the ordinary trapped gully under waste pipes, because to form a barrier against the passage of sewer gas a water seal must be formed. If intercepting traps of too large an area or of improper form are allowed to be inserted this is the fault of the engineer himself, but under every-day conditions it is indubitable that in any household the water in an intercepting trap must be changed dozens of times daily, and that the likeness of condition of such traps to a cesspool is chimerical and foolish in the extreme.

As to the proposition for the free ventilation of sewers by means of house drains, this is not an unselfish method of transferring the obligations and difficulties from the engineer to the shoulders of the householder. That it would mean the transmission of disease from one house to another and over a whole town by the conveyance of pathogenic germs through the untrapped sewers and house drains appears to have been unobserved, and no responsible engineer should light-heartedly disregard the danger which a neglect of the obvious precaution to enforce the disconnection of house drains from sewers would produce.

I HAVE recently come across several instances where Local Authorities have incurred extraordinary expenses in repairing their highways in consequence of extraordinary traffic passing along the same by contractors and builders. It may be useful to many of my readers to learn that agreements as to compensation are very commonly arrived at on the basis of amounts varying from 1½d. to 2½d. per ton of weight carried per mile. There are many surveyors whom I have met who were unaware that they were able to recover such compensation for damage to roads caused by excessive traffic or unreasonable user, and it is therefore advisable that I should direct their attention to the provisions of Section 23 of the Highways and Locomotives Amendment Act, 1878, and Section 12 of the Locomotives Act, 1898. The object of these sections, as pointed out by the Local Government Board, is to enable "highway parishes to recoup the excessive expenditure not unfrequently occasioned by extraordinary and exceptionally heavy traffic arising from building and similar operations of a temporary character, and from other causes by which the road accommodation provided for all alike at the public expense is sometimes abused by individuals for private purposes."

THERE are many of my readers who have to design abattoirs for their Authorities, and on this account it is necessary that they should be acquainted with the best fitments and automatic gear suitable for such buildings. It is for this reason that I advise them to obtain the catalogue of Messrs. Lockerbie and Wilkinson, Ltd, whose head office is Station-street, Birmingham. This catalogue contains illustrations not only of such appliances, but of a large class of materials which are essential to the municipal engineer, as locks, partition fittings, fanlight stays and gearing, acetylene generators, and artistic brasswork, and general ironmongery, and I may also say it is one of the most beautifully got up catalogues I have seen for some time. SENEX.

NEW WATER SUPPLY REGULATIONS.

ON Monday last a conference of representatives of the Corporation, the County Council, the City of Westminster, and the London Borough Councils was held at the County Hall, Spring-gardens, for the purpose of considering the proposed amended regulations of the metropolitan water companies.

Mr. W. H. DICKINSON, chairman of the County Council, presided, and, in opening the proceedings, said the proposed regulations seriously affected the householders and owners of house property. They, as a Council, had taken examples of houses, so that the actual cost of carrying the regulations into effect, for instance, in a house of the rateable value of £45, would be £53. In another house, in which there were not so many alterations needed, and which was rated at £250, the expenditure necessary would be £85, and if it had not been of modern construction, with a proper cistern, the expenditure would have been £123, but it was a more serious question in regard to working-class dwellings. The Council was building a block of artisans' dwellings, and if these were constructed under the old regulations the cost would have been £60 for water fittings. Under the new regulations, if adopted, the cost would be £125. If this kind of thing were to operate all over London the position of London was one of great seriousness.

The conference proceeded to the discussion of the

regulations in detail. The cistern system was generally condemned, but the conference passed a resolution to the effect that, while agreeing that storage cisterns were necessary to ensure customers against temporary stoppage of supply, and that such cisterns should be properly designed for storage of water, they were of opinion that the character of the cisterns was a vital public health question, upon which public opinion stood in much need of guidance. It was suggested that the London County Council should take such steps as it might deem expedient for holding a public competition of the various improved cisterns now in the market, and to make suitable awards of merit thereon.

A resolution was also passed in favour of three-gallon cisterns as against two-gallon cisterns, as was also a motion that no apparatus capable of discharging automatically should be fixed except where water was supplied by measure, or by special agreement in writing, and in the event of refusal by the company there should be an appeal to the local Sanitary Authority, whose decision should be final. It was decided to ask the London County Council to take the necessary steps to procure the adoption of the amendments made by the conference in the proposed regulations. Although several representatives said that their Borough Councils intended to be represented by counsel at the inquiry by the Board of Trade next Monday, to support the County Council, the hope was generally expressed that each of the Borough Councils would be separately represented by counsel to show that the County Council were not alone in opposing the proposed regulations. In the event of the alterations as suggested by the companies being carried into effect, the conference agreed that the cost should be defrayed by the companies.

THE SOCIETY OF ENGINEERS.

The first ordinary meeting of the Society of Engineers for this year was held on Monday evening, at the Royal United Service Institution, Whitehall. Mr. Henry O'Connor, president for last year, in the first instance occupied the chair, and presented the premiums awarded for papers read during his term of office. Mr. Charles Mason, president-elect for 1901, was then introduced by his predecessor, and took the chair, Mr. O'Connor being the recipient of a hearty vote of thanks upon his retirement.

Resolutions of sympathy and condolence with the King and Queen and other members of the Royal Family upon the death of Queen Victoria, and expressive of loyalty to the Throne, having been unanimously adopted,

Mr. Mason, in his inaugural address, spoke of the work of a municipal engineer, especially in large towns, and he expressed surprise that more headway had not been made with the adoption of a scheme of subways for London, as the few now existing were frequently too small for the purposes they were intended to serve. He described an ideal subway occupying the entire width of the street, and said that although the cost and difficulties of construction would be great, if some scheme of rental based upon the expenses incurred in continually opening up and making good the street surfaces were arrived at, and devoted to the payment of interest on capital, a good return would result. Touching on the subject of cremation, he observed that it was worthy the special study of those interested in municipal engineering as a system which was likely to be introduced generally in the near future. He predicted that before the middle of the present century every town and borough in the coutry would have a crematorium as part of its general equipment. In regard to the science of heating and ventilation, the small extent to which well-known and efficient systems of heating had been adopted in private houses was due chiefly to old associations as to the hearth and to cheap fuel. There were advantages and disadvantages in warming by steam, hot water, and hot air, and it was impossible to adapt the same principle to all buildings. He urged the necessity of attending to the smallest details of construction in each case, as the circulation of hot water was very easily adversely affected. He discouraged heating by high-pressure water and hot-air stoves for domestic work. Ventilation was closely allied to, and dependent upon, heating; the introduction of an ample supply of pure fresh air being the main consideration in arranging any system (whether natural or mechanical), without allowing such air to become overheated or to cause draughts on its admission into the apartment. Want of attention to an apparatus after it had been installed was the chief cause of inefficient working, and very often the engineer received the blame which should be bestowed on the caretaker. As in the case of heating, however, it was impossible to adopt the same principle for all buildings.

A vote of thanks to the president closed the proceedings.

Public Works.

SEWERAGE.

The Narberth Rural District Council has adopted plans for the sewerage of Saundersfoot.

The Urban District Council of Haywards Heath is acquiring a site for works of sewage disposal.

The West Penrith Council has decided to advertise for tenders for carrying out the Marazion sewerage scheme.

The East Ham Urban District Council has received the sanction of the Local Government Board to the borrowing of £2460 for sewer ventilation, repayable in thirty years.

At the last monthly meeting of the Portslade and Southwick Outfall Sewage Board, the clerk read a letter from the Local Government Board relative to the application for sanction to raise £3700 to complete the works, and asking for further information and plans.

A Local Government Board inquiry was held at Enfield recently for the purpose of receiving the application of the Edmonton District Council for loans of £9550 for works of sewerage and surface water drainage, £8312 for works of street improvements, £3740 for works of sewage disposal, £850 for the provision of hydrants, and £500 for the purchase of a steam roller.

The Radstock Urban District Council, near Bath, is threatened with proceedings by the Somersetshire County Council for polluting the watercourse running through the town, and has now unanimously decided to instruct Messrs. D. Balfour and Son, of London and Newcastle, to prepare a scheme of main sewerage and sewage disposal to submit to the Local Government Board for its approval.

The Sewage Committee of the Gorton District Council last week recommended that application be made to the Local Government Board for sanction to borrow £17,000 for the purpose of further sewerage and sewage disposal works within the district. The Committee also recommended that application be made to borrow £2750 to carry out certain works of surface water drainage in the district, and a further £3000 to cover the cost of additional works of sewerage and sewage disposal already carried out.

The Watford Urban District Council proposes spending about £20,000 in works of sewerage, water supply, and street paving.

The Bournemouth Town Council has decided to make application to the Local Government Board for sanction to a loan of £2000 for carrying out certain drainage works.

The Joint Committee of the Brampton and Haltwhistle Rural District Councils has instructed Mr. Harry W. Taylor, A.M.I.C.E., of Newcastle-on-Tyne and Birmingham, to prepare schemes of sewerage and water supply for Gilsland.

The Shipley District Company has resolved that application be made to the Local Government Board for sanction to borrow £30,000 for drainage and sewage treatment purposes, in addition to all sums already sanctioned for such purposes.

At the last monthly meeting of the Belper Urban Authority a communication was received from the Local Government Board with reference to the sewerage scheme, which is being undertaken at a cost of £40,000. Some modification has been made in the original scheme, but to this the department offered objection, and the work will be delayed. Mr. Jones said it had taken six years to reach the present stage, and they had done admirably to prevent the heavy expenditure.

Mr. Carter, C.E., Edinburgh, has made another report on the disposal of the Dumfries sewage. He virtually pronounces impracticable the schemes for conveying the sewage of Dumfries and Maxwelltown to the sea; points out important difficulties in the way of treating it by joint-works on the Maxwelltown side, which might otherwise be economically advantageous to Dumfries; and indicates his adherence to the scheme which he originally submitted, with the possible substitution of a field on Castledykes property for Kingholm as the site of the purification works.

An important Local Government Board inquiry was held at Greetland, last week by Mr. E. A. Sandford Fawcett. The West Riding Rivers Board had applied to the Local Government Board for consent to take proceedings against the Greetland Dyeworks Company, Greetland, in respect of offences alleged to have been committed against the West Riding of Yorkshire Rivers Act, 1894, and the Local Government Board had directed an inquiry into the subject matter of the application. After some discussion the Inspector said the Rivers Board was willing to forego the prosecution provided that if the land was not secured from Lord Mexborough the company would proceed to lay down the works in June on other land. The inquiry then adjourned, and the Inspector subsequently visited the dyeworks.

Few, perhaps, have any adequate idea, says the *City Press*, of the magnitude of the main drainage system of London, a system that was founded by the late Metropolitan Board of Works on the lines laid down by Sir Joseph Bazalgette, and has since been greatly extended by the London County Council. What the responsibilities of the Council in this direction are may be judged from the figures given this week with reference to the quantity of sewage dealt with last year. It seems that altogether no less a quantity than 84,609,000,000 gallons was treated, this representing an advance of 6,929,186,000 gallons compared with the output of the previous twelvemonth. What the total will be when the population of London grows to double or treble what it is at present it surpasses one's powers of calculation to imagine. Already, owing to the strain on the existing works, the Council has been obliged to enter into a contract for the expenditure of close upon a million sterling upon the enlargement of the outfall.

Last week, Colonel Steele, an Inspector from the Local Government Board, held an inquiry at Doncaster, as to the proposed sewage schemes for Askern, Bawtry, and Bentley.

Sanction has been obtained by the Wortley Council to the borrowing of £12,700 for purposes of sewerage and sewage-disposal works in the Chapeltown special drainage district.

The Mutford District Council has passed the following resolution:—"That application be made to the Local Government Board for sanction to borrow a further sum sufficient to cover the cost of the sewerage scheme at Kessingland and the incidental expenses, it having been found, after twice advertising for tenders, that the work cannot be carried out within the limits of the loan already sanctioned."

Mr. R. H. Bicknell, M.I.C.E., held an inquiry at the District Council Offices, Drighlington, last week, on behalf of the Local Government Board, with respect to a petition for a Provisional Order empowering the Council to put in force the powers of the Land Clauses Act with reference to certain lands required by them in the parish of Tong for purposes of sewage disposal. Mr. Walter Beverley supported the application of the District Council, and said the works of sewage disposal had formed the subject of three or four inquiries previously. The District Council now proposed to construct the work on a site just outside the township, situate in Tong, and belonging to Sir Robert Tempest. The site consisted of a little over six acres, and the estimated cost of the works of sewerage and sewage disposal was £12,600. Mr. Bairstow opposed the application on behalf of Sir Robert Tempest on the ground that there was no right of cart road to the site, and that the construction of sewage works there would interfere with Sir Robert's sporting rights. Evidence was given on each side.

WATER.

The Tamworth Town Council is requiring lands for waterworks.

It is understood that Mr. Baxter, C.E., Dundee, has been asked to state how long the present pipes from Loch Benachally will serve their purpose, also to suggest in what way Rattray may have an ample supply of water.

The Examiners of Standing Orders of the House of Commons certify that the standing orders applicable to the Southport Waterworks (Transfer) Bill, the Bury Corporation Bill, and the Bury Corporation Tramways Bill have been complied with by the promoters.

An adjourned meeting of the Littlehampton Urban District Council was held last week for the purpose of receiving tenders for water mains in connection with the new water supply for the town. The tender of Messrs. Nunn and Co., Tenderden, for constructing water mains at Crossbush, at £2410, was unanimously accepted.

The Torquay Town Council held a special meeting last week, and passed a resolution extending the time for Teignmouth District Council to exercise the option offered to take a supplementary water supply from the Torquay waterworks. Teignmouth wrote that they were considering various schemes for augmenting their supply, and had been unable to come to any decision. It was agreed to extend the option one month from the 20th ult. Afterwards the Council went into committee to discuss the financial position of the Corporation, especially the arrangement with the bankers respecting the temporary loan of £60,000 for the purchase of the watershed and the prospect of floating a new loan for £100,000, on which question the Mayor and the Town Clerk visited London recently.

The Joint Committee of the Brampton and Haltwhistle Rural District Councils has instructed Mr. Harry W. Taylor, A.M.I.C.E., of Newcastle-on-Tyne and Birmingham, to prepare schemes of water supply and sewerage for Gilsland.

At the last monthly meeting of the Hayfield and Mellon Rural District Council on the question of the Stockport Corporation Water Bill, which materially affected the district, it was agreed to consult Mr. Hodgson, engineer, and also to instruct the Clerk to draw up the necessary petition required for offering formal opposition to the Water Bill if required, and employ counsel.

The Cromer Water Bill came last week before Mr. Jeune, one of the Examiners of the House of Commons, for proof of compliance with the preliminary Standing Orders relating to private Bill legislation. There was no opposition at this stage, and the necessary formal proofs having been given, the Examiner decided that the Standing Orders had been duly complied with. The Bill will accordingly be reported in due course for first reading.

The Stratton and Bude Water Supply Bill having been declared to be in compliance with the Standing Orders of Parliament, the Urban District Council has passed the following resolution:—"That the Council do confirm the propriety of the promotion of a Bill in the ensuing session of Parliament to authorise the Council to purchase the undertaking of the Bude Harbour and Canal Company, and to confer powers on the Council with respect to local government and water supply, and for other purposes."

The report and statement of accounts of the directors of the Cleveland Water Company for the past half-year states that after providing for all expenditure there remains a balance of £5044 4s. 1d. This sum enables the directors to recommend that a dividend at the rate of £9 10s. per cent. per annum on the "Original" and "A" shares, and £6 13s. per cent. per annum on the "B" shares (free of income tax), be declared payable on and after the 14th inst., and that £125 be reserved for contingencies. This will absorb £3355, and leave a balance of £1689 4s. 1d. to be carried to the credit of next half-year's account.

Meetings have been held at Stainforth, Hatfield, and Hatfield Woodhouse to protest against the expense of the scheme foreshadowed by the County Council. General satisfaction with the present supply has been unanimous. If the villages are ultimately compelled to have recourse to a fresh source of supply, each of them seems determined to have nothing to do with Thorne. The District Council does not expect to have the views and estimates of the engineer for consideration until after the election, when the demands of the County Council will be brought prominently before the ratepayers.

At Denbigh County-court last week, Mr. E. Roberts, solicitor, applied to Judge Sir Horatio Lloyd to enter judgment for the Denbigh Water Company against the Denbigh Town Council for damage done by the steam roller and for an injunction against its further use, or in lieu of this that he grant a new trial. At the last Court the Judge gave judgment for damage done to all pipes more than 18in. deep, and granted an injunction; but after reading a full report of the trial, and seeing that the company had practically waived the injunction, he wrote to the Registrar, withdrawing the injunction. Mr. Ralph Bankes, barrister, on behalf of the Corporation, resisted the present application, contending that the Judge's view as to the company's waiving the injunction was correct, and that there were no new facts justifying a new trial. The Judge refused the company's applications, and gave the costs of the day to the Corporation, including counsel's fee.

At a recent meeting of the St. Germans District Council with reference to the reply to be forwarded to the Local Government Board, giving particulars of the amount of money spent in connection with the Downderry water supply, the deputy Clerk stated that the total sum was £1848.

We understand that it is still the intention of Kelso Town Council to carry out its scheme for taking a supply of water from the sources on Ladyrig farm—this time, however, for the requirements of Maxwellheugh alone—and that, with this object in view, the Council has made approaches to the parties interested in order that an arrangement may be come to.

A public meeting of the owners and ratepayers of New Mills was held last week for the purpose of expressing by resolution consent to the opposition by the Urban District Council of the Stockport Corporation Water Bill, now in Parliament, which seeks to take the waters of Kinder and construct waterworks there. A resolution was passed, on the motion of the Chairman, giving consent to such opposition, and to the cost of the same being paid out of the district rate.

LIGHTING.

The price of gas at Hull is to be reduced from 2s. 10d. to 2s. 8d. per 1000ft.

The Belper District Council has decided to oppose the Derbyshire and Notts Electric Power Bill.

The Cleckheaton Urban District Council proposes a loan of £25,000 for electric lighting and refuse destructor purposes.

The laying down of additional electric cables is to be undertaken by the Corporation of Newcastle-on-Tyne at a cost of £10,000.

The Arbroath Gas Corporation, as Electric Lighting Committee, has agreed to recommend to the Town Council that the Council should undertake the installation instead of a private company.

With a view to a greater demand, the Electricity Committee of the Islington Borough Council recommends that, at the expiration of the present quarter, the price for electrical current during the hours of daylight be reduced from 3½d. to 2d. per unit.

We understand that a company has been negotiating with a property owner in the town of Brentwood to acquire land upon which to erect an electric lighting station. If such were established it might prove beneficial to the lighting of the town, which has not been invariably satisfactory.

The half-yearly report of the Gaslight and Coke Company shows that after providing for the fixed charges there remains a balance available for distribution of £551,753, out of which the directors recommend a dividend on the ordinary stock at the statutory rate of £4 8s. per cent. per annum, carrying forward the sum of £221,570.

A special meeting of the Cromer Urban District Council was held last week, when the business was to consider a report from the Highway Committee in reference to the purchase of a site for an electric lighting station and store yard. Mr. F. W. H. Keith, on behalf of the Bond Cabbell Trustees, offered an acre of ground on the Beach Station-road for £800, to include road-making, the Council to agree in the diversion of a footpath running through the property, and also to a stipulation that no burning of material should be allowed upon the site. On the motion of Mr. H. Broadhurst, M.P., seconded by Mr. H. Rust, it was decided to accept the offer, on the condition that the stipulation as to the burning of material was struck out. It was stated that the original price asked for the land was £1370.

THE Middlesex County Council has resolved to oppose the application of the Friern District Council for an Electric Lighting Order unless clauses for the protection of the Council are inserted.

MESSRS. CLAUD HAMILTON, LIMITED, have secured the contract to fit up the necessary appliances required for the electric lighting of the concert hall and principal restaurant at the Glasgow International Exhibition.

THE Walsingham District Council has granted the application of the Parish Council of Fakenham for leave to break up streets and roads under the jurisdiction of the District Council for the purpose of laying on the mains for lighting the town with electricity if the town should sanction the scheme which would shortly be laid before the ratepayers.

AT the last monthly meeting of the Newark Urban Authority, the Electric Lighting Committee reported that it had considered the two schemes for electric works for the borough, submitted by Mr. Vesey Brown, and had resolved to recommend the Council to adopt the larger of the two schemes at an estimated cost not exceeding £30,000, and that application should be made to the Local Government Board for sanction to a loan of £30,000 for the purpose, and that on such sanction being obtained the purchase of the sites in Water-lane from Mr. B. Chatterton and Miss Handley should be proceeded with. The confirmation of the report was agreed to, only one voting against it.

A PROPOSAL is before the Ramsgate Corporation for the construction of a tunnel from the harbour to the gasworks, a distance of about three-quarters of a mile, for the conveyance of coal and other material to and from the gasworks. The question of supplying the borough with electricity, under the recent Order obtained by the Corporation, was discussed with some warmth at a recent Council meeting, and ultimately it was decided to invite tenders for laying the connecting cable for the supply of electricity within the compulsory area, and also to approach the Thanet Light Railway Company to ascertain on what terms they would be prepared to supply electric current in bulk. The last-named proposal met with strenuous opposition from the Chairman of the Committee and other members, who urged that the Corporation should retain all the powers obtained under its Order in its own hands. It is intended to use electricity as the motive power for the tunnel already referred to.

COLONEL LUARD held an inquiry at Llandudno last Thursday on behalf of the Local Government Board with reference to an application by the Council for power to borrow £1500 for purposes of electric lighting. Mr. A. H. Preece, the consulting electrical engineer to the town, with whom was Mr. C. H. Morton, the resident engineer, stated that it was proposed to extend the steam condenser at a cost of £1126; building work was to be carried out at a cost of £87; and for engineering expenses and contingencies £287 was estimated. The balance of the borrowing powers applied for was for future outlay in duplicating the armature of the circulating pump which supplies the condensers, a new pump being also provided for. A portion of the engineering expenses is due to the putting in of a new air pump, which is to take the place of that supplied by the contractor for the works, who is taking it back in exchange for the larger apparatus, free of cost. A wooden louvre arrangement is to be erected on the south and west sides of the works to keep the rain from the condenser.

GENERAL.

THE Woolwich Borough Council has obtained a loan of £6550 from the London County Council for the erection of stables and the construction of an underground convenience.

THE Southport Urban District Council is requiring land for hospital purposes.

THE London County Council has decided to lend £2430 to the Shoreditch Borough Council for street improvements.

THE Provisional Orders applied for by the City Council of Leeds and the Urban Council of Prescot are for the clearance of insanitary areas.

A LOCAL Government Board inquiry has been held at New Brompton into the application of the Urban District Council for sanction to a loan of £3400 for private street works.

THE Health Committee of the Thirsk Council recommended the City Council, at its meeting last Monday, to take the public baths in St. George's Field under its own control, the lease under which they are let to Mr. Shepherd expiring on February 4th.

A CABLE between Porthcurnow, Cornwall, and St. Vincent, Cape Verde Islands, by way of Madeira, was according to a notification from the Eastern Telegraph Company, opened for traffic on Wednesday in last week thus completing the new direct cable route betwee Great Britain and South Africa.

AN inquiry was held at Bexhill last week respecting the application of the Bexhill Urban District Council for sanction to utilise certain land acquired at Clinch Green as a site for an infectious diseases hospital. The opinion was expressed that the site was a very suitable one, and there being no opposition, the inquiry closed.

MR. W. H. WALKER, the receiver for the debenture holders in the Isle of Man Tramways Company, has filed his accounts for the term between 25th July and 31st December last. The gross receipts were £29,820. Out of this was paid in working expenses and interest on debentures £23,861, leaving a balance of £5958, which is now paid into Court, available for creditors and shareholders.

THE minutes of the Parks and Cemetery Committee of the Gorton District Council last week asked the Council to sanction the borrowing of a further sum of £15,000 for the completion of the whole of the cemetery. Mr. H. Dean, in moving its adoption, said the Council had already borrowed £15,704, and the £15,000 it was now proposed to borrow would make up the full loan sanctioned by the Local Government Board of £30,704 as the total cost of the cemetery. The recommendation was adopted.

THE usual meeting of the Sub-committee of Edinburgh Town Council on the cable tramways took place last week, and steps were taken to push on the Portobello line as quickly as possible. The contractors maintain that they will have the line open and carrying traffic by the summer-time, but the Committee has its doubts as to whether this is possible. Another point discussed was the carrying of the cables at the foot of the Mound. At this point there is a large tunnel in which Water Trust pipes, &c., are carried, and it has been arranged that the pulleys on which the cable will run will be fixed to the top of the tunnel.

THE total number of cases of small-pox in Belvidere Hospital, Glasgow, at the end of last week was 386. A great number of persons are being re-vaccinated. Two cases from Shawlands and Crossmyloof of a mild nature have been removed to Belvidere Hospital. There have also been cases from Crosshill and Pollokshields. A rumour that a number of the city car conductors had been affected has been contradicted by the manager, who states that not a single official has been off duty with small-pox. Special arrangements made last year for re-vaccinating the whole of the staff were largely taken advantage of. The cars are thoroughly cleansed and disinfected every night, and every precaution is being taken to prevent the disease spreading.

The Ashford Urban District Council is acquiring a site for an isolation hospital.

The Metropolitan Borough Council of Bethnal Green requires land for an electric generating station and refuse destructor.

The Middlesbrough Town Council has decided to apply to the Local Government Board for sanction to a loan of £2500 for street works.

The Grimsby Sanitary Committee has decided to recommend the Town Council to undertake the removal of household refuse instead of getting the work done by contract as hitherto. It is suggested that a destructor be built at each end of the town to consume the combustible refuse, and the expenditure is estimated at £4400.

To such an extent has the epidemic of measles, which broke out in the first week of January, spread in the south-west of Mull, that there are now no less than 120 cases being attended in the Ross district of Mull by Drs. MacKechnie and MacNab. In Bunessan there are 40 cases. The schools of Iona, Creich, and Bunessan are closed.

Annual Reports Received.—Maldon Rural Sanitary District (M.O.H.), Borough of Stalybridge (M.O.H.), Kettering Urban District Council (M.O.H. and Sanitary Inspector).

PERSONAL.

Dr. Broster has been reappointed Medical Officer for Wirksworth.

Mr. John W. Davies has been appointed Surveyor for the Holywell urban district.

The Romsey Town Council has increased the salary of Mr. Jenvey, Borough Surveyor, by £20 per annum.

The salary of Dr. Pilkington as Medical Officer of Health for Preston has been increased from £450 to £550 per annum.

Mr. J. Veit, Assistant Borough Surveyor for Barrow-in-Furness, has been appointed Surveyor for the Goole urban district.

Dr. T. Martin has been appointed Medical Officer and Public Vaccinator for the third district of Newbury, in room of Dr. Lambert.

Mr. James Morris, Inspector of Nuisances for Hanley, has been appointed Inspector of Nuisances and Surveyor for the rural district of Docking, Norfolk.

Mr. Charles Broun, Burgh Surveyor, Airdrie, has been appointed Burgh Surveyor and Sanitary Inspector for the burgh of Hawick, at a salary of £210 per annum.

Dr. Sheppard has been reappointed Medical Officer of Health for New Forest rural district, at an annual salary of £300, subject to the approval of the Local Government Board.

We congratulate Dr. Allan, late Medical Officer of Health to the Strand Vestry, on his appointment as Medical Officer of Health to the city of Westminster. The salary is £800, rising to £1000.

At a meeting of the Electricity Works Committee of Lincoln Corporation last week, Mr. C. S. Vesey Brown, the Electrical Engineer, tendered his resignation, which was accepted. Mr. Vesey Brown, who is leaving to take the position of General Manager to the Northern Counties Electricity Supply Company, Limited, Newcastle-upon-Tyne, came to Lincoln about five years ago to superintend the installation of electric lighting for the city, and under his direction the supply has been developed most satisfactorily.

Dr. C. H. Conolly has been reappointed Medical Officer of Health for Wood Green, subject to the approval of the Local Government Board, at a salary of £100 per annum.

Dr. Karl C. Gimson, M.B., B.C. (Cantab), has been appointed by the Metropolitan Asylums Board for one year as the Medical Officer of Bridge School, on the terms and with the duties already approved by the Board.

Mr. C. S. Vesey Brown has resigned his position as Electrical Engineer to the Lincoln Corporation, in order to take up the appointment of general manager to an electricity supply company in Newcastle-on-Tyne.

The Brighton Corporation has decided to increase the salary of Mr. Johnston, the Waterworks Engineer, from £650 to £900 a year, Mr. Johnston having agreed to remain in the service of the Corporation for at least another five years.

The Local Government Board has written the Tyne Port Sanitary Authority confirming the appointment of Dr. Harker as Medical Officer for the year, but urging the Authority to consider the advisability of having an officer to devote the whole of his time to the work.

Mr. John R. Douglas, who for the past four years has acted as county Road Surveyor of Nairn, has accepted an appointment as Road Surveyor in the Colony of the Gold Coast, Western Africa. Mr. Douglas has tendered his resignation to the Road Board, and will leave for West Africa within a month.

Miss Marie Stewart, of London, was last Monday appointed by the Leeds Corporation a Sanitary Inspector for the city. The lady succeeds in the office Miss Hobson, who has resigned. The new Inspector was educated at Girton, and has been studying medicine. The post was sought for by about a dozen ladies.

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OFFICIAL TRANSACTIONS.

The following meetings will be held on Wednesday, February 13th, 1901 :—

Examination and Literary Committee, at 3 p.m.
General Purposes and Finance Committee, at 4 p.m.
Election Committee, at 5.15 p.m.
Members' Sessional Meeting, at 7 p.m.

LAW CASES.

A Question of Closets.

At Newton Abbot Petty Sessions Mr. Hamlyn, of the Clay Cutters' Arms, Chudleigh Knighton, was summoned by the Newton Abbot Rural District Council, as the Sanitary Authority, for committing two breaches of the bye-laws in respect of the erection of buildings at Kingsteignton, and allowing the same to be occupied without certificates from the Council for occupation. Mr. Horner, Clerk to the Rural Council, prosecuted, and Mr. J. Hutchings defended.

Mr. Horner said that the bye-law in question had been approved by the Local Government Board, and distinctly stated that plans of various buildings about to be erected must be submitted to the Council for approval, and if passed the building must be erected in accordance with those plans. In March of last year plans were submitted on behalf of Mr. Hamlyn for the consideration of the Council by Mr. Segar, architect, of Newton Abbot. They were approved, the plans showing that earth-closets were to be provided

some 54ft. from the dwelling-houses. In August Mr. Rogers, Sanitary Inspector, reported to the Rural Council that he had received an application from Mr. Hamlyn for the Council to extend their sewer to the cottages. The Council then stated that they could not accede to the request, and at the same time informed him that he must carry out the work in accordance with the plans approved by the Council. Later in the year Mr. Segar again wrote to the Council asking them to rescind their decision, but this they refused to do. In December Mr. Rogers reported to the Council that water-closets had been substituted for earth-closets, and that Mr. Hamlyn had applied for certificates for occupation of the cottages. The Council then passed a resolution that as the plans had not been complied with they were unable to grant certificates. Notwithstanding that, Mr. Hamlyn had allowed the cottages to be occupied.

Mr. Rogers, Sanitary Inspector, produced the plans approved by the Council for the erection of four cottages by Mr. Hamlyn at Chudleigh Knighton, showing that earth-closets were to be provided. The cottages were built in accordance with the plans, but earth-closets had not been provided. There was no water to be obtained within several feet of the closets.

Dr. Mapleton, Medical Officer of the district, said he had inspected the houses which were occupied. They contained ordinary hand-flushed closets, which were injurious to health. In reply to Mr. Hutchings, witness said he had never known a properly-erected earth-closet to be injurious to health. Hand-flushed closets were likely to cause disease.

Mr. Hutchings, in defence, said in the Act in question there was a section which stated that houses should not be occupied until certificates were given stating that there was ample water supply. It was evident that the Council considered there was insufficient water supply, and therefore he could not defend his client on that point in the face of the section of the bye-law. At the same time, however, he complained that the Council had not stated to his client what they really desired. He considered that the closets erected by Mr. Hamlyn were far better than those desired by the Council. About two years since the Council instructed an owner of some property near Mr. Hamlyn's houses to have closets similar to the ones his client had erected in the houses instead of the ones now desired by the Council.

Mr. Segar, architect, said he recommended that the hand-flushed closets be erected, as he considered they were more beneficial in many respects.

The Bench imposed a fine of £1 and costs in each case.

The Smoke Nuisance in Huddersfield.

At the Huddersfield Police-court, Messrs. Joseph Lumb and Sons, Limited, manufacturers, Folly Hall, were charged with having failed to obey an order from the Corporation's Sanitary Inspector to abate a smoke nuisance on eight days from September 18th to October 22nd.

Dr. E. G. Annis, Medical Officer to the Huddersfield Corporation, said seven summonses were issued against the defendant firm in October last, and were heard on the 29th of that date. The Chairman then said it was evident the firm had endeavoured to obviate the nuisance, but as they had not quite succeeded they would adjourn the case for three months. Since then the following developments had taken place. On December 19th he (Dr. Annis) received a letter from the defendants asking him to call at their premises and see the arrangement they had made for consuming smoke. He accordingly called on December 20th, and Mr. Jesse Lumb explained what alterations had been made at the boilers. He stated that they had found that the stoker did not always keep the patent doors working properly, and thereby had caused more smoke than was necessary. They had now fixed additional steam blowers to the four boiler fires, and were about to add an automatic arrangement to the patent doors, so that they would work properly without the stoker being able to alter them. In his (Dr. Annis's) presence the four boiler fires were stoked together with the new arrangements, and seemed to work satisfactorily. To Mr. Lumb he explained that in any case where they found that proper and sufficient plant had been provided by owners, and that then black smoke was emitted, they would have to proceed against the stokers themselves. The Authorities had taken several observations of this chimney since the hearing of the case, and the averages had been 6 minutes, 6½ minutes, 8 minutes, 5 minutes, and 2½ minutes, black smoke. The latter average was from December 15th to January 14th, so that it would seem that the alterations had resulted in a considerable diminution in the amount of smoke. He asked for a small penalty, with costs.

Mr. F. Sykes (Messrs. Ramsden, Sykes, and Ramsden), on behalf of the defendants, said that both since the summonses were issued and before, Messrs. Lumb had been at great trouble to prevent the emission of black smoke. They appreciated the efforts which Dr. Annis had made since October last, and they felt that he and those with whom he had to confer would in future appreciate the position in which they were placed, and that they were doing everything in their power to carry on their business with as little obnoxious element as possible. When he entered the Court that morning he understood that Dr. Annis would be satisfied with the payment of costs, and he was prepared to assent to that.

Dr. Annis said he had received a message from Messrs. Lumb that morning to the effect that they left the matter entirely in his hands.

After a little further argument, Dr. Annis consented to the payment of the costs alone, and the case was settled on those terms.

NOTES AND QUERIES.

Subscribers may obtain advice on matters appertaining to Public Health Law and Municipal and Sanitary Engineering. Letters should be addressed "Notes and Queries," The Sanitary Record, 5, Fetter-lane, London, E.C. If an answer be required immediately, a stamped addressed envelope must be enclosed

2083.—Yearly Reports of Law Cases: How Obtainable. —"J. S." writes:—"Can you please inform me where I can get the reports of cases under the Public Health Acts decided in the Queen's Bench Division in the year 1897?"

Answer.—Such cases are reported in the *Justice of the Peace*, the *Law Times* Reports, the *Law Journal* Reports, &c. We advise, however, that "The Yearly Digest of Cases" (price 15s.), which is a digest of all cases decided in the Superior Courts and reported in all the Reports, be procured. From this publication the reader may ascertain what cases are of especial interest to him, and also what publication contains a full report of the case—for no one publication reports all the cases decided.

2084. — Insanitary Workshops: Offensive Trades. — "E. C." writes:—(1) "Is it the duty of the Sanitary Authority to enforce the requirements as to reasonable temperature in workshops? (2) In a cordial manufacturer's establishment (not a factory, there being no machinery) two men are employed all day in a loft where fermentation is carried on. The windows and doors of the loft are darkened, and made almost air-tight to keep up the temperature. What powers, if any, has the Factory Inspector or the Sanitary Authority to act? (3) In a thickly-populated district there is a knacker's yard, to which is attached a chemical works. There is frequently an offensive smell from the horseflesh being boiled, and from the bones and animal refuse being 'digested.' Can the Sanitary Authority succeed, and, if so, under what powers in proceedings for having the yard closed and the business transferred to a less densely-populated district?"

Answer.—(1) No. (2) If the workshop, not being ventilated or kept in a cleanly state, or is injurious to the health of those

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employed therein, it will be a nuisance under Sec. 91 of the Public Health Act, 1875, or Sec. 107 of the Public Health (Ireland) Act, 1878. (3) We presume the district referred to by the querist is in Ireland, whence his letter is addressed, although he omits to state such an important fact. If this be the case the Local Authority should institute proceedings under Sec. 130 of the Public Health (Ireland) Act, 1878.

2085.—Books on the "Times" System: Books for Workshop Inspectors.—"E. C. L." writes:—(1) "What is, or where shall I find particulars as to the *Times* system of obtaining books as referred to in reply to Query 2042 in your issue of December 21st? (2) What books containing cases decided as to outworkers, &c., would you recommend for a Factory and Workshop Inspector under the Sanitary Authority? Also (3) what book giving prices of material and work would you recommend?"

Answer.—(1) See issue of Sanitary Record for January 19th, 1900. (2) There is no publication devoted specially to the reports of such cases. Redgrave's "Factory Acts," price 6s., or Abraham and Davies' "Law Relating to Factories and Workshops," price 5s., will be found useful. (3) Lockwood's "Builders' Price-book," price 4s., and Buckingham's "Contractors' Price-book," price 5s., are recommended. Any of the books named may be obtained from the office of this journal, post free, at the prices named.

2086.—Bacterial Sewage System: Particulars.—"Surveyor" writes:—"I am about to deal with the sewage of my district, which is a mining one, sewered on the separate system, with a population of 13,000, and not likely to increase very rapidly. The privy system is in use. It is proposed to provide open septic tanks with double contact beds. I should be glad if you could advise me as to the number, capacity, and description of beds to be used and work required. The water company estimate the water supply at 10 gallons per head, but from a careful gauging of the sewer at the outfall, the flow averages only six gallons per head in twenty-four hours. In face of this will it be necessary to base my calculations on a dry-weather flow of more than 10 or 12 gallons per head? I may add that money was borrowed from the Local Government Board for sewage disposal some time ago."

Answer.—If the Local Government Board have, as stated by the querist, sanctioned a loan for the purpose of sewage disposal, this could only be done on a scheme submitted to them at the time, and approved. If this approved scheme is to be now disregarded by the Local Authority, and an entirely new scheme substituted, the cost of which is to be defrayed with the loan obtained for the original scheme, the Local Authority should obtain the approval of the Board to the same. The present requirements of the Local Government Board as to capacities of sedimentation tanks, contact beds, &c., are fully set forth in Adam's "Local Government Board's Requirements as to Sewage Disposal Schemes," price 2s. 6d., obtainable from the office of this journal, which the querist should follow. The capacities of the tanks and contact beds should be estimated on a sewage flow equivalent to 20 gallons per head, as doubtless the insanitary and filthy privy system which is in use in the district will be abolished, from both a sanitary and financial point of view, when a proper sewerage system is completed.

2087.—Colonial Sanitary Inspectorships: Vacancies.—"W. R." writes:—"Being qualified for the post of Sanitary Inspector and also Food Inspector, will you please advise as to how I could obtain a berth in South Africa, Canada, or any of the Colonies?"

Answer.—We published in our issue of September 21st last, page 263, a list of papers in South Africa in which advertisements for Sanitary Inspectors are occasionally inserted, and this should be referred to. Vacancies in Canada are advertised in Canadian journals only, and not in England. Reference should also be made to Query 1871 in our issue of July 13th last.

2088.—Food and Drugs Acts: Proof Spirit: Meaning of Term.—"Underproof" writes:—"I have a certificate from an analyst upon a sample of whiskey which states that it 'contains 8 per cent. of added water over and above that contained in 25 degrees underproof whiskey, it being a diluted whiskey of the strength of 31·3 degrees.' I shall be greatly obliged to you if you can tell me how these figures are arrived at, and what percentage of water is in whiskey which is 25 degress underproof?"

Answer.—Proof spirit is a term used to denote a mixture containing 49·24 per cent. alcohol by weight and 50·76 per cent. water, or 57·5 per cent. alcohol by volume and 42·5 per cent. water. Spirits weaker than this are described as so many degrees underproof, so that pure water would for this purpose be described as 100 degrees underproof. Whiskey described as "25 degrees underproof" means that the sample contains 75 measures of proof spirit and 25 measures of water added. Now, 75 measures proof spirit contains 43·1 measures of alcohol, therefore spirits of 25 degrees underproof would contain 56·9 per cent. water by volume. In the same way 31·3 degrees underproof means that the sample contains proof spirit 68·7 volumes and water 31·3 volumes. Now this 68·7 volumes of spirit, if it were 25 degrees underproof, would have added to it 22·9 volumes water; but it has added to it 31·3 volumes, *i.e.*, 8·4 volumes of water over and above that contained in spirits of 25 degrees underproof.

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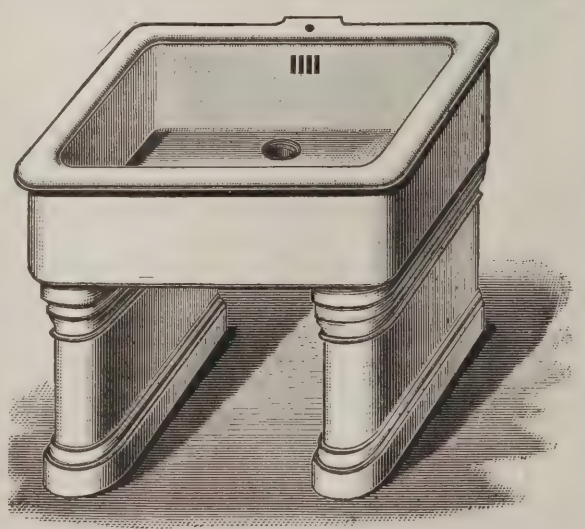

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PUBLIC LIGHTING BY GAS & ELECTRICITY

By W. J. Dibdin, F.I.C., F.C.S.,
Late Chemist and Superintending Gas Examiner to the Metropolitan Board of Works and the London County Council.

(*Continued from page* 112.)

CHAPTER XVII.—MEASUREMENT OF CURRENT.

Having briefly described the principle of the modern electric generators, motors, and transformers, we will proceed to define more clearly some of the units in which the power of a current is expressed, and which have been frequently mentioned in the foregoing chapters, as well as to describe what relation they bear to one another, and, as far as possible in a simple manner, how they are measured, and what their equivalents are in measures with which all are familiar.

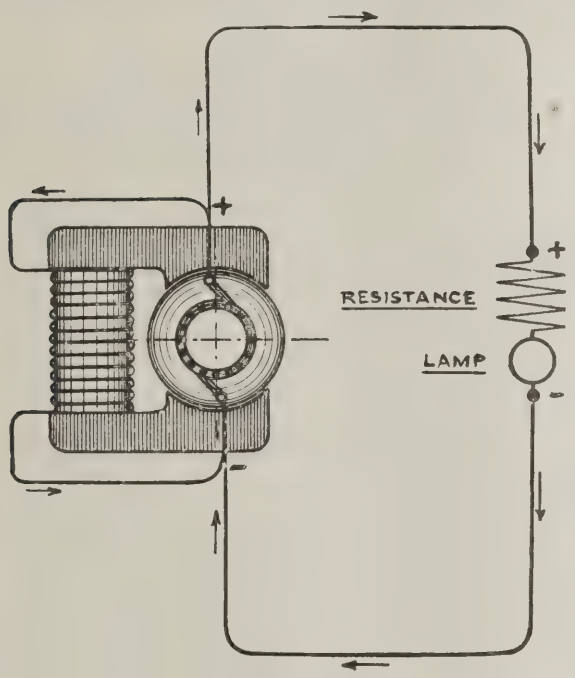

Fig. 28.

The ampère, the unit in which the quantity of electricity conveyed in a current is expressed, is that quantity flowing for one second of time through a solution of nitrate of silver in water, which deposits 1·12 mgr. of silver. It may also be measured by the power of the magnetic lines of force which it is capable of creating when conducted along a coil of wire; and on this property is based the construction of the modern ampère-meter, or ammeter.

The ohm, the unit in which resistance to the flow of a current of electricity is expressed, equivalent to friction in mechanics, is the resistance of a column of mercury having a sectional area of one square millimetre, and a length of 1063 mm., at a temperature of 0 deg. Cent. That is to say, if a current of one ampère with an electromotive force of one volt, is applied to the end of the column of mercury, the resistance is just sufficient to absorb the whole of the current by converting it into heat, so that none is available at the other end.

The volt, the unit in which the electromotive force caused by a difference of electric potential in a conductor is expressed, or, as it is sometimes called, the pressure of a current, is that electromotive force which produces a current of one ampère in a conductor whose resistance is one ohm.

The law discovered by Dr. Ohm, and called after him Ohm's law, may be expressed as follows:—

The electromotive force necessary to cause a current of electricity to flow from one point to another in a conductor measured in volts is equal to the quantity of the electricity measured in ampères multiplied by the resistance of the conductor measured in ohms. Thus 1 volt = 1 ampère × 1 ohm, or 1 ampère = 1 volt ÷ 1 ohm. To illustrate more clearly the relation that exists between these three units, we will again refer to our illustration of the bent tube filled with air—see Fig. 5.

When the tap is turned on full, so that the air can pass freely from one side of the tube to the other, if the piston is moved there is very little resistance to the movement, and very little pressure need be applied to cause it to move. If we now half close the tap so that the opening is only half as large as it was when turned on full, the resistance to the passage of the air is twice as great as it was before, consequently twice the pressure must be applied to the piston to move it the same distance in the same time.

When the tap was turned on full, if a pressure of 1 lb. applied to the handle of the piston was sufficient to move it 1ft. in one second, assuming that the area of the piston is one square inch, 12 cubic inches of air will pass through the tap in one second; and when the opening in the tap is reduced by one-half, so that twice the resistance is offered to the passage of the air, twice the pressure, or 2 lb., must be applied to the handle of the piston to send the same quantity of air, 12 cubic inches, through the tap in one second. Or if 1 lb. pressure is applied, only 6 cubic inches of air will

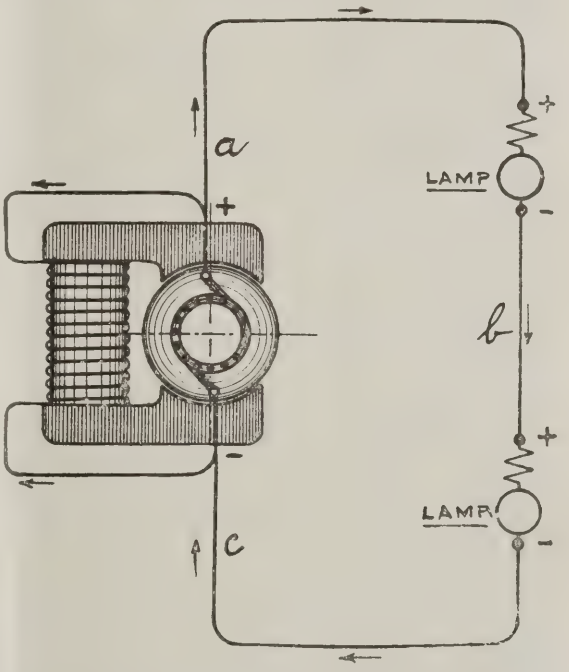

Fig. 29

pass through the tap in one second. The ampère, the ohm, and the volt bear the same relation to one another when a current of electricity flows through a conductor, that the quantity of air, the resistance offered to its passage dependent on the size of the hole in the tap, and the pressure applied to it by means of the piston bear to one another in our illustration.

Let it be assumed that in a circuit supplied with a constant current from a generator having a difference of potential of 100 volts between its positive and negative terminals, we wish to connect some arc lamps constructed to work with a difference of potential of

40 volts between each of their positive and negative terminals, the quantity of current required by each to give the requisite candle-power being 10 ampères.

Now, since according to Ohm's law, ampères = volts ÷ ohms, then ohms = volts ÷ ampères, and in our example we have 40 volts and 10 ampères, so that the resistance of each lamp will be 40 ÷ 10 = 4 ohms.

To connect a single 40-volt 10-ampère lamp to the 100-volt circuit, we should have to increase the resistance of the lamp to 10 ohms by adding to it an extra resistance of 6 ohms, so that 10 ohms × 10 ampères = 100 volts, thus involving a loss of 60 per cent. of the electrical energy—see Fig. 28. We can, however, double the efficiency of the installation by connecting two lamps in series, that is, one behind the other, so that the same current flows through each lamp in succession, but the arrangement necessitates always having both lamps alight simultaneously. In this way the resistance of the lamps is increased to 8 ohms, and it will be necessary to add an extra resistance of only 1 ohm to each lamp to give the requisite voltage. Fig. 29 shows the arrangement.

It may be mentioned here that it is always advisable or even necessary to add some extra resistance to each arc lamp, as this is of assistance to the mechanism for feeding the carbons in producing a steady light.

Since the difference of potential between *a* and *c* in Fig. 29 is 100 volts, and the resistance 10 ohms, a current of 10 ampères will flow from *a* to *c*, and the resistance between *a* and *b* being only 5 ohms, the difference of potential between *a* and *b* is 50 volts, and between *b* and *c* also 50 volts, making a total of 100 volts between *a* and *c* with a constant current of 10 ampères flowing from *a* to *c*.

As a current of 10 ampères is required for each lamp at a pressure of only 40 volts, the resistance of each lamp being 4 ohms, the extra resistance of 1 ohm is required only to reduce the voltage by absorbing a portion of the current.

The conducting wire may be compared to a tube of uniform bore throughout, but with a diaphragm in the centre having a piston on one side of it and an outlet hole on the other side—Fig. 30. If the air on one side of the tube is compressed by means of the piston, the pressure on the piston side of the diaphragm will be greater than the pressure on the other side, and the difference of pressure will depend on the size of the opening in the diaphragm and on the outlet hole; for if the diaphragm is entirely closed there will be a certain pressure on the side where the piston is, but on the other side there will be none, and if the diaphragm is entirely removed the pressure will be uniform throughout the tube, and any intermediate difference of pressure will depend on the size of the opening in the diaphragm. The piston in this case may be compared with the generator, the outlet hole with the resistance due to the arc lamp and the diaphragm with the intermediate resistance to regulate the pressure of the current flowing through the lamp.

Again referring to our illustration of the bent tube, this time having two taps instead of one, as shown in Fig. 31, a movement of the piston in the direction indicated by the arrow compresses the air at *a* and produces a partial vacuum at *c*, and if the air is compressed to 1 lb. per square inch at *a* the vacuum at *c* will have a pressure of 1 lb. per square inch also, but negative to the pressure at *a*, so that the difference of pressure between *a* and *c* will be 2 lb. per square inch.

Assuming that both the taps are closed, the condition of the air at *b* is the same as that of the air outside surrounding the tube, and in respect to the air inside the tube at *a* and *c* neutral. The difference of pressure between *a* and *b* will therefore be 1 lb., and between *b* and *c* 1 lb. also, making a total of 2 lb. between *a* and *c*. If the openings in both taps are alike they both offer the same amount of resistance to the passage of the air, and if they are both opened simultaneously the air will rush from *a* into *b* and from *b* into *c* with a uniform velocity without affecting the condition of the air at *b*, which still remains neutral, assuming, of course, that the initial pressure on the piston is kept up. This is obvious, for if the air at *b* were compressed to the same degree as at *a* no air would pass from *a* to *b*, and likewise if rarified to the same degree as at *c* no air would pass from *b* to *c*.

This serves to illustrate the condition of the electric current at different points in a circuit when lamps or motors are connected in series—see Fig. 29—and also the nature of the current at the positive and negative terminals of a generator; the one being comparable to the outward pressure when air is compressed in a tube, and the other to the inward pressure when a vacuum is formed in a tube.

The power of a current of electricity is the product of the current as measured in ampères, and the difference

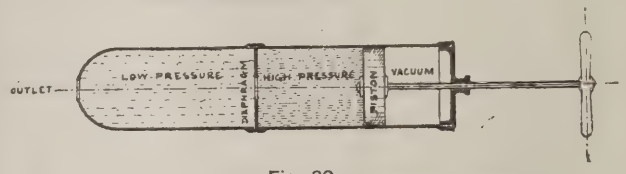

Fig. 30

of potential or pressure as measured in volts between any two points in a circuit intercepted by a resistance, which may be a motor or a lamp, or even a more or less imperfect conductor; and at any given instant this power is theoretically equal to the power which a motor or any other resistance exerts at the same instant in doing a certain amount of work.

For instance, an electric generator connected with a circuit for supplying a motor with current supplies only just sufficient for the work which the motor has to do, and when the load is taken off the motor the current is only sufficient to overcome the resistance to the flow of the current in the conductors and the resistance to the rotation of the armature caused by the air and by the friction in the bearings of the armature spindle; and just as in our illustration we showed that the pressure of the air on one side of the tap is a positive pressure when the piston is moved, and on the other side a negative pressure, so the pressure or potential of the current in the circuit is positive on one side of the

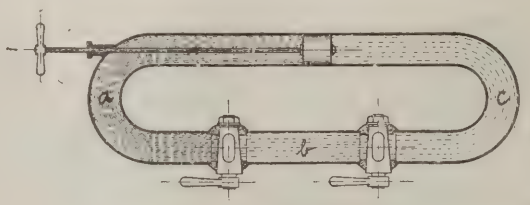

Fig. 31

motor or other resistance, and on the other side negative. The difference between the pressure of the air on each side of the tap is that available for work and represents the potential of the current.

As there is no loss of air in the air pump when the air passes from one side of the tap to the other, but only a transmission of power by the aid of the air molecules, so there is no loss of current when this is used for driving a motor or for producing a light, but only a reduction of potential in doing work.

The action is merely a change of condition instantly transmitted along a metal conductor. The current carries the initial motive power, comparable to air under pressure, to the point at which the work has to be done, which may be the vibration of carbon molecules to produce a light, or the creation of magnetic lines of

force to drive a machine, or the production of heat in overcoming the resistance of an imperfect conductor; and for comparison it may be said that, like the air molecules in our air pump, after doing its work, it passes on at a lower pressure to the minus or negative wire there to equalise the potential. As a continuous working pump would gather up the air molecules and again compress them, so the dynamo continually creates a condition of difference of potential, and thus supplies a constant current of that force which we term electricity.

THE STAINES RESERVOIRS.*

By M. Mawson, A.M.I.C.E.

In the month of November, 1900, according to the latest published return, 57 per cent. of the water consumed in the metropolis was procured from the river Thames, about 21½ per cent. from the river Lea, and the remainder, 21½ per cent. from springs and wells in the Thames and Lea valleys. A very small quantity, used only for sanitary purposes, is obtained from certain ponds at Hampstead and Highgate, but this amount is practically negligible.

The average daily flow of the river Thames during the years 1883-1899, according to the gaugings taken by the Thames Conservancy at Teddington Weir, amounted to 1131 million gallons in twenty-four hours. As the intakes of the water companies are situated above Teddington, it is necessary, in order to arrive at the flow of the river which can be compared with the rainfall on the watershed, to add the quantity abstracted by the companies. This quantity, which is a constantly-increasing one, was, during the same period, 97 million gallons a day on an average. Adding to this the quantity gauged at Teddington, we have 1228 million gallons daily available on the average of years for the supply of the metropolis, after the requirements of the river have been met.

What constitutes the legitimate requirement of the river has been the subject of much discussion in times past. As many different figures have been put forward as there are interests concerned; but the Thames Conservancy—a representative body having charge of the river—has agreed, before two Royal Commissions, that all requirements can be met if a quantity of water not less than 200 million gallons daily is at all times allowed to flow over Teddington Weir.

Some witnesses before the Royal Commission on Metropolitan Water Supply, in 1898, desired to place the limit at 100 millions a day, if a half-tide weir were erected at Wandsworth similar to that existing at Richmond, with the object of ensuring that no undue extent of foreshore shall be uncovered at any state of the tide. Above Teddington the man visiting the river for pleasure knows not whether 100 or 200 million gallons are passing down, nor does he greatly care, so long as the water is held up at the proper level in the several reaches; and it must be remembered that there are always a sufficient number of freshets to keep the river in good condition.

The problem which has to be faced by the companies drawing their supplies from the river is then, to provide such an amount of reservoir capacity that even in dry years like 1893, 1898, and 1899 they may be enabled to supply the whole of the water which their districts may demand without reducing the flow at Teddington below the limit laid down.

The Royal Commission presided over by Lord Balfour of Burleigh in 1893 considered this question in great detail, and examined several schemes put forward for the construction of the necessary storage in different parts of the Thames Valley. Most of these schemes were based on the assumption that natural valleys would be utilised in the manner usual in hilly districts, the difficulty in the present case being, generally speaking, to find a valley with a sufficiently narrow entrance and a water-tight bottom of an area great enough to hold the required quantity with economy. The system adopted must also be capable of any extension as the demand for water increases.

The proposal favoured by the Commissioners was that placed before them by Mr. Walter Hunter, M.I.C.E., and the late Mr. Alex. Fraser, M.I.C.E., the former a director of, and the latter at that time engineer to, the Grand Junction Water Company. By this scheme the flat country in the lower part of the Thames Valley between Windsor and London was to be utilised for the construction of artificial reservoirs, formed by the erection of banks containing a core of puddle carried down through the stratum of gravel which covers the whole area, and tied into the sheet of London clay underlying the gravel. The question of the most economical height of bank and depth of excavation must be determined by the location and required capacity of each instalment of the work, as also whether the water should be put into the reservoir and let out wholly or partially by gravitation or pumping, it being obviously desirable, if expense permit, to fill the reservoir quickly by gravitation when the river is high and to empty it by pumping only as and when the stored water is needed for purposes of supply. Unfortunately there are not many sites where the level will permit of this desirable state of affairs without the use of a long conduit for the conveyance of the water from some point higher up the river.

In the year 1895 the Grand Junction, New River, and West Middlesex water companies, being in want of a further supply, instructed Mr. Hunter, in association with Mr. R. E. Middleton, M.I.C.E., to carry out an instalment of this scheme, providing enough reservoir capacity to enable them to afford an aggregate additional supply to their consumers of 35 million gallons daily, under the statutory condition that none of this water should be taken from the river in such a way and at such a time as would reduce the flow at the point of intake below a quantity which corresponds to the flow of 200 million gallons daily over Teddington Weir. This quantity is fixed by the Staines Reservoirs Act of 1896 as being 300 million gallons measured at Penton Hook below Staines, where the Thames Conservancy are constructing a new weir specially adapted for measuring purposes.

The apparent discrepancy between the figures at Penton Hook and Teddington is due to the fact that the existing companies drawing their water at Hampton have already powers to draw certain quantities at that point, and the 200 limit at Teddington is, it must be remembered, the "actual" and not the "natural" flow. The quantity which may be supplied to the consumers direct from the river may be increased by consent of the Local Government Board, from 35 to 45 million gallons a day, to meet possible cases of emergency. The total quantity of water which the Staines Reservoirs Joint Committee is permitted to draw daily is 100 million gallons, of this 35 millions will pass, if required, directly to Hampton down a conduit to be hereafter described, leaving 65 millions as the quantity which can be pumped into the storage reservoirs, to be be held for use when no water, or only a portion of the 35 million gallons required daily, can be drawn at the intake without infringing upon the condition imposed at Penton Hook Weir.

It is to be distinctly understood that there is no obligation on the part of the Joint Committee to make up the flow at Penton Hook to the specified minimum of 300 millions should the natural flow of the river not come up to that standard. It is merely stipulated that

* Paper read before the Civil and Mechanical Engineers' Society, on Thursday, February 7th, 1901.

no action on their part shall reduce the flow below the minimum. It is only in exceptionally dry seasons that this state of things will obtain, and then only for a few days. In some years there will be practically no draught upon the reservoirs, while in a summer such as that of 1899 they would be used to their utmost.

The point of intake, at which the whole of the water will be drawn from the river, is a few yards above Bell Weir, about a mile above Staines Bridge. The entrance to the conduit is protected, first by a row of fender piles carrying a floating boom to prevent the approach of boats or floating timber. Inside this is a semicircular screen of wrought bars spaced ¾in. apart. Inside this grating, and separated from it by the width of a gangway, is a row of copper wire gauze screens of the usual description, arranged in double grooves so that a duplicate can be dropped in before any particular screen is lifted out for washing, an operation which will be performed on a paved platform on the down-stream side of the intake, the screen being conveyed thither on a trolley running on the gangway above mentioned.

Having been freed from floating impurities, the water will pass through four sluice openings, each 5ft. 3in. wide and with sills 6ft. 4in. below the "ordinary summer level" of that reach of the river, at which level as nearly as possible the lock-keeper is supposed to maintain it. Each sluice opening is closed by a cast iron penstock with gun-metal faces, actuated by a direct-acting hydraulic cylinder in the sluice house above. At either end of each opening is another chamber into which a penstock similar to the working door, but with a hardened face, may be lowered for the purpose of repairing the main door when the chamber has been emptied. The house over the sluice chambers is somewhat ornamental in character, in view of the commanding position which it occupies on the bank of the river. At one end is a tower, containing the accumulator for the hydraulic machinery, and tanks for the supply of water to this machinery and for general purposes.

The machinery consists of a gas engine, a set of three-throw hydraulic pumps, the accumulator above mentioned, and the sluice cylinders, four in number. A hand-pressure pump is also fitted in case of a breakdown. The accumulator is loaded to 700 lb. per sq. in.

Water for washing the screens and general purposes will be provided by a small centrifugal pump, so arranged that it can draw from any sluice chamber, and deliver direct to a hose connection on the washing platform, into the storage tank in the tower, or into the fire service. An oil gas plant is provided in a separate building capable of supplying sufficient gas for several days' use for engine and lighting purposes. Adjoining the sluice house, a pair of cottages is provided for the accommodation of workmen, each having a sitting-room, kitchen, three bedrooms, bath-room, and offices. The elevation is designed to harmonise with the sluice and gas producer houses. A small wharf is available for landing material from the river if desired.

Having passed the sluices, the water enters the conduit proper, a concrete structure consisting of two side walls with a batter of 1 in 5 on the water face and 1 in 12 at the back, 1ft. 4in. wide at the coping level, and an invert consisting of an arc of a circle with a shord of 13ft., and a versed sine of 1ft. 3in., 9in. thick at the centre. The total depth from the coping level to the invert is 8ft. and the maximum working depth of water 6ft. 4in., the total quantity which could be passed at this depth would be 147,700,000 gallons per day, thus allowing for future extension of the reservoirs. The conduit is lined with a 3 to 1 Portland cement rendering ⅜in. thick, and the fall throughout is ·01ft. per chain, or ·8ft. per mile, an extra amount of ·08ft. each being allowed at some of the syphons hereafter mentioned. The concrete of which the conduit is composed is a mixture of 1 part of Portland cement to 4 of aggregate, the latter consisting of a selection of the ballast from the excavation, washed where necessary, the quantity of sand being determined by experiment.

At every 30ft. along the conduit an expansion joint is constructed of brickwork bonded and laid in soft asphalt, in order to allow for expansion and contraction of the concrete, or slight settlement, without permitting leakage. A joint is put in on each side of the abutments of bridges or other heavy portions of the work. About 300 yards from the intake, the conduit, in order to meet the requirements of a landowner, is constructed as a double tunnel, with vertical sides, each division being 8ft. 3in. wide, with an invert having a versed sine of 9in.; the roof has a rise of 2ft. 6in., and the total height from roof to invert is 8ft. 10in., the depth of water being as before 6ft. 4in. At the ends of the tunnels grooves are formed for stop planks, these planks being arranged to completely close the opening and so prevent the passage of flood water, should the river at any time overflow its banks, and consequently fill the first portion of open conduit.

Following upon the double concrete tunnel, in fact, built into it, is a double inverted syphon, so-called, under the Colne Brook. This syphon, which is typical also of two others on the route, is formed of two tubes of ⅜in. steel plates with vertical sides and curved top and bottom, the approximate cross section being 7ft. 6in. by 5ft. 6in., the tube being curved longitudinally to a versed sine of some 17in. to ensure the requisite depth being maintained in the river above. Each tube was built up in a temporary timber cradle, and lowered into a trench previously excavated in the bed of the stream. Both tubes being thus placed in position, a shell of concrete was deposited round and between them, the whole operation being completed without the necessity of diverting the river. These steel syphons run full, under a slight head, and an extra ·08ft. of fall is allowed at each to compensate for increased friction. Close to this syphon is a 48in. pipe for the purpose of drawing water from the Colne Brook. This pipe has its entrance protected by a grating and a set of copper gauze screens similar to those at the intake.

The bridges carrying roads over the conduit are, generally speaking, of the arch type, 12in. thick at the crown, built in 5 to 1 concrete, over a half-brick lining of brindled brick, the ends of the arch being finished with two rings and a key block. The parapets are of ordinary red brick, with stone copings and dwarf railing. The abutments are formed by a thickening of the wall of the conduit. In the case of accommodation bridges, the brick lining is omitted, the arch being entirely in concrete, while in one or two cases where the levels did not permit of the use of an arch, the bridge consists of steel decking, finished at the sides with rolled joists carrying the standard brick parapets or unclimbable fencing, as the case may be.

At about one mile from the intake the conduit passes in immediate succession under the Great Western Railway, the river Wyrardisbury, and the London and South-Western Railway. The tunnels under the two railways are double, and, generally speaking, similar to that already described, except that they are built chiefly in brindled brickwork instead of concrete. Alongside, and built into the London and South-Western tunnel, is a 48in. pipe for drawing water from the river Wyrardisbury, which here runs between the two railways. This pipe is provided with copper screens in the same manner as the intake from the Colne Brook.

The river itself is crossed by a double steel syphon constructed in the same way as that already mentioned at the Colne Brook. At this point a siding is connected with the London and South-Western Railway, and carried alongside the conduit to the pumping station, crossing the river Colne on an ordinary plate girder bridge, while the conduit passes under in a steel double syphon.

(*To be continued.*)

TUBERCULOSIS—INFECTION, HEREDITY, PREVENTION, HYGIENIC TREATMENT.

By A. G. Young, M.D., Secretary State Board of Health, Maine, U.S.A.[1]

(*Continued from page* 114.)

The ubiquity of the bacillus.—Some persons who should know better have assumed that the danger from the germ of tuberculosis is almost everywhere present—in our streets, in our places of business. The truth is that, in the open air, the danger of infection does not exist. The tubercle bacilli are quickly destroyed by natural agencies, as we have seen. It would seem that, if any class of persons were exposed to infection from the dust of the streets of our cities, it would be the street-sweepers. Yet, the proof has been adduced that that particular class of persons, in the city of Berlin, have a greater degree of immunity than the average citizen. Years ago Cornet showed very conclusively that the bacillus of tuberculosis may, for all practical purposes, be considered absent in our streets and in all buildings not habitually occupied by consumptive patients. Even in rooms occupied by a careless consumptive patient, the patient is himself endangered more than anyone else. He surrounds himself with a halo of infectious dust which lessens his chance of recovery.

Emphasising the fact that pulmonary tuberculosis is essentially a result of exposure to infection in enclosed spaces, we advance to a consideration of some of the special conditions under which infection occurs.

House epidemics.—The observation that successive cases of consumption occur in the same family or the same home is co-extensive with the historic period. At different epochs and in different lands these observations have not received the same interpretation. While some of the fathers of medicine believed firmly in the contagion of consumption, and strict regulations were enforced in various places at later dates, the medical profession of more modern times, until within the last decade or two, has generally acquiesced in the impression that hereditary influence explains the matter. While the doctrine of the infectiousness of tuberculosis is not the daughter of bacteriology, as has been remarked, the exact methods of modern research have confirmed the conclusions of the earlier "contagionists," and have pushed forward the doctrine of infection as the more rational explanation of such house epidemics of tuberculosis as the following:—

In a paper on "Tubercular Infective Areas," Dr. Arthur Ransome,[14] of England, gives, among others, these three illustrative cases:

I. McI., aged twenty-one, student, son of healthy parents, both living, no family history of phthisis; took ill with a cough while studying in Glasgow in 1870, neglected it, came home at the end of the session, cough got worse, found both lungs tuberculous, died of phthisis in nine months. Had one sister, nineteen, and one brother, seventeen. The former a perfectly healthy girl, nursed her brother closely; ill shortly after his death, and was dead in five months after him of phthisis. The brother, who slept with I. McI. during part of his illness, and wore his clothes after his death, showed symptoms of failing health before the sister died, and in about eighteen months died of phthisis.

A young man of the Indian navy came home suffering from phthisis. In a few months two of his sisters were taken with the same complaint, and died. A third sister married, and soon afterwards died of the same complaint; the young man also died. Later on the father was similarly affected, and died. After his death the widow became phthisical, and died also. Four years covered the whole outbreak, that is, from the arrival of this young man from India. The father was originally a very strong, healthy man, and all the children healthy up to about twenty or twenty-one, or even later. One sister still lives, and is now between forty and fifty.

In 1880 the Sisters' Convent in the village of Ferdinand, was entirely free from consumption; it is well ventilated, is high and dry, and is well drained. In the autumn of 1880, a girl of 18 was found to be consumptive. She continued to sleep in the general dormitory. One sister after another now commenced with similar symptoms, and in four months after the first case began there were nine cases in sisters who had been thought to be exceptionally healthy. Four sisters died in the course of a year. After complete isolation of the sick, the epidemic was stopped.

Dr. E. O. Otis,[15] of Boston, refers to the following case narrated by Dr. Marsh, which illustrates very well the influence of massive doses of the infection in causing pulmonary consumption to assume a specially rapid and malignant form:

A German, aged sixty-two years, weighing 200 pounds, of good family and personal history, came to him in a state of advanced consumption. Two years before he had lost a son, aged twenty-three years, from the same disease. Three months later his wife, who had nursed the son, began to sicken. She was a German, aged fifty-nine years, strong, robust, and well preserved, weighing more than 220 pounds, with a good family history. She died within twenty months, having had frequent hæmorrhages from the lungs and intestines and almost constant diarrhœa. Within five months the husband was in the condition just described; while a daughter, aged twenty-two years, worn out from constant attention to the sick, was in a fair way to become phthisical, if not already so. It was learned that all three had expectorated on the walls, floors, and in the corners of the apartment, the man preferring to expectorate under his bed. The daughter slept in the same room with the sick man, and slept beside her mother during her illness.

Dr. Otis also refers to the late history of the Apache Indians as an example of domiciliary infection.

In a community of 400 of them taken from a free nomadic life in Arizona and New Mexico and transferred to Alabama, where for four years they occupied log cabins badly constructed and situated in a low, damp hollow, and in which filth gradually accumulated "until they became veritable incubators of disease," the deaths from tuberculosis in five years were seventy-eight, or 43⅓ per cent. of the total number of deaths.

Jaccoud,[16] of Paris, among other evidences of the infectiousness of consumption presents the following case:—

In the autumn of 1872 an artisan, his wife and five children (four sons between the ages of three and a-half and fourteen, and a daughter fifteen years old) went to live in a village of Denmark, where they inhabited a small room already occupied by another family, consisting of a man, his wife, and a grown-up son affected by febrile phthisis. They remained in this crowded and confined abode, in which the air was rendered truly poisonous by the presence of the patient, until January 3rd 1873, when they left the place for a more healthy dwelling. Before this, however, at the time of Christmas, the five children, who had been previously in good health, and unaffected by scrofula, suffered from pulmonary disease, and the evolution of the complaint was so rapid that they all died after the respective

[1] Reproduced, by special permission of the author, from the eleventh report of the Maine State Board of Health, U.S.A.

[14] "Transactions" Epidemiological Soc. vi., 128. 1886-87.

[15] "The Causes and Conditions of Pulmonary Tuberculosis, and How to Avoid them," page 6. 1898.

[16] "Curability and Treatment of Pulmonary Phthisis," page 76. 1885.

periods of seven weeks, three months, three months and a-half, and seven months. The daughter, whose age was fifteen years, and who had only remained during one day in the infected room, was attacked like her brothers, and it was her death which occurred at the end of three months and a-half.

In a lately published work by Prof. Cornet,[17] of Berlin, he presents indubitable proof of the infectivity of pulmonary consumption, particularly among the occupants of infected rooms. In connection with about 800 cases of consumption, he has carefully traced out all the available facts which have a bearing upon the questions of infectivity, heredity, or predisposition, not limiting his inquiry to the patient and his nearest relatives, but extending it to all of his available connections, fellow-workmen and associates, sometimes making a physical examination of as many as thirty persons in getting at the history of a single case. Notwithstanding the well-known difficulty in fixing the exact sources of infection which occurred months or years previously, he was able to trace out its source in more than half of his cases.

Cornet says that when a large number of apparently hereditary cases of tuberculosis are examined it must occur to the unprejudiced mind that the parents of many of the patients did not show the first symptoms of tuberculosis until after the birth of the child in question and sometimes not for many years after, or that the death of the parent from tuberculosis occurred remarkably near the time of the death of the child.

In many cases it will be found that the single cases of tuberculosis are separated by almost a generation, but careful investigation shows that in the majority of these cases a brother or sister, or other near relative who stood in intimate relation with the family, served as a connecting link between the disease of the parents and that of the child. The following case illustrates this:—

Case 136. Admitted, 1892. Auguste Vil., 31 years, married. Her father died in 1887 at the age of 64 of senile debility and asthma (?). The father's parents were very aged; her mother's parents died young. The collateral line of relatives of the father were all well, but on the mother's side all had died of tuberculosis. The mother died of tuberculosis in 1877, at the age of 47 years.

One year after the death of the mother a 16-year-old brother who had been constantly in the house, died of tuberculosis; a sister 25 years old who had been married three years, but who was infected before leaving her mother's home, died in 1897. In 1883 an 18-year-old brother died, and in 1886 another brother, 24 years of age, who slept with the other brother, died of consumption. In 1887 a brother 35 years of age died after coughing and expectorating 14 years.

The patient, Auguste Vil., showed symptoms of the disease in 1889. These children had been much together. The elder sister, 39 years of age, long absent from the paternal home, nursed Auguste Vil. for eight months, and after that coughed and raised, and shows by physical investigation, signs of consumption.

From the point of view of heredity it is hard to reconcile the fact that only a part of the children of tuberculous parents are affected, but from the point of view of infection, the fact will often be developed from a careful investigation of the family history, that some of these children were at home more than others, either on account of their tender age, incapacity for working, or from other causes, and that those members of the family who remained well were away from their home most of the time. The following case illustrates this:—

Case 8. Admitted, 1892. Auguste C., single, 24 years of age. The mother died of hæmorrhage from the lungs in 1885. The mother's father died at the age of 84; one sister, living and well; mother's mother died of cancer. Of the brothers and sisters of the patient who lived in the same room with the mother, one only, a brother 15 years of age, remains well. On the other hand, two brothers, one of 16 and the other of 14 years of age, have lately died of consumption. The patient Auguste C., became tuberculous in 1885, and in 1889 went to live with another sister 25 years of age, who is now also tuberculous.

A married sister, 26 years of age, who was away from home at the time of the illness of her mother, is well and strong, and the same is true of her children. The same is also true of a brother 22 years of age, who at the same time was away from home. A 16-year-old sister who slept in another room remains well, and so does the father, who during the illness of the mother slept in another room, and at night was away from home at his work.

The investigations of the prevalence of tuberculosis in some of the sections of New York City show that, of the infected houses, 28·2 per cent. contained 55·8 per cent. of the cases, and these occurred in only 10·2 per cent. of all the houses in the ward.

Many of the houses have had one or more cases every year for three consecutive years, some of them having had as many as eight or eleven cases during this period. Several houses, in which one or more cases of tuberculosis have been reported in the last three years, have had deaths from the same disease in them for eight or nine years, viz., five houses, in which twenty-two cases have been reported since 1893, have had thirty-six deaths from tuberculosis from 1888 to 1893 inclusive.

As Dr. Tracy, the registrar of the city, remarks:—It would appear that there is no question as to the infectious nature of the disease. Though tuberculosis causes from 14 to 15 per cent. of the total number of deaths in the city, yet it is confined within narrow limits and to a small number of houses.[18]

(To be continued.

[17] "Die Tuberculose," Berlin. 1899.

[18] Quoted from Brush. Report of Special Com. to N.Y. Legis. 1899.

INCORPORATED SOCIETY OF MEDICAL OFFICERS OF HEALTH.

THE VALUE OF HOSPITAL ISOLATION FOR SCARLET FEVER.

A SUBJECT of immense sanitary importance was discussed at the ordinary meeting of the Incorporated Society of Medical Officers of Health, held on Friday last at the offices, 197, High Holborn, W.C. It was nothing less than the scientific calling in question the value of hospital isolation for scarlet fever cases, and in several ways the lecturer challenged popular and accepted theories in regard to the matter. In view of the freshness and effect of the problem there was a very large attendance of members and friends. Dr. J. C. McVail, the president, occupied the chair, and those present included Mr. Wolf Defries, Drs. J. T. Wilson, W. H. Symons, C. Sanders, W. A. Bond, M. Gapp, J. H. Beale Collins, Shirley Murphy, A. Newsholme, J. C. Johnson, G. Newman, E. F. Willoughby, W. Groves, H. Kirkwood, H. R. Farrar, J. Robinson, G. E. Yarrow, J. Williamson, Childs, J. S. Tew, G. Millsom, P. Boobbyer, H. M. Richards, A. Griffiths, G. H. Day, D. A. Waite, D. L. Thomas, D. S. Skinner, J. Kelland, A. G. K. Cameron, A. C. Pearson, W. E. Godbet, and Dr. F. J. Allan and H. Kenwood, the hon. secretaries, and many others.

Dr. C. KILLICK MILLARD, M.D., D.Sc., the Medical Officer of Health of Burton-on-Trent, and late Medical Superintendent of the Birmingham City Fever Hospitals, gave the paper, the subject of which was "The Value of the Hospital Isolation of Scarlet Fever." He said

that he fully realised the great importance of the subject of the paper, which had not been written without due consideration. He had not the slightest prejudice against isolation hospitals; in fact, he had every reason to feel favourably towards them. But the paper had been written from absolute conviction, and he had been careful not to say anything more than he believed the facts he had ascertained justified. Fair criticism would be welcome, and no doubt there would be plenty of it. His observations were strictly limited to the hospital isolation of scarlet fever. There had been a tendency in the past to treat the isolation of all infectious diseases as one question, but that was a mistake. It by no means followed because isolation hospitals for small-pox, cholera, or typhus, had been of the greatest value, that they would also be of value for such a disease as scarlet fever. Having given some quotations to show the orthodox opinion with regard to isolation hospitals, he could say, on the authority of Sir George Buchanan, that isolation in hospital for scarlet fever was received as an accepted principle of public health work without being founded on any basis of statistical proof. That proof had not, since the adoption of the principle, been forthcoming, and therefore he had taken upon himself to collect statistics to show what the real position of affairs is. In response to his inquiries he had received 113 returns, 31 being from the great towns, 81 from smaller towns, and one from the county of London. He desired to express his indebtedness to the Medical Officers of Health of all these towns for the ready way in which they had helped him. It was a significant fact that fifteen out of the thirty-one Medical Officers of the great towns preferred to express no opinion on the subject, and among the small towns about the same proportion were also not prepared to commit themselves; nearly the whole of the remainder expressed themselves as in favour of hospital isolation for scarlet fever, but a few were doubtful. He attached great importance to these facts, as showing that a considerable measure of doubt existed to-day in regard to the subject. Dr. Millard then exhibited a number of carefully-prepared diagrams of the large towns, and exhaustively showed the results of analysis of the returns in such towns as Huddersfield, Nottingham, Bradford, Preston, Swansea, Warrington, the object being to discover how far hospital isolation had affected the prevalence of scarlet fever. The practice, however, it was shown by the mass of figures presented, had little if any effect in reducing the prevalence of the disease, even in towns where as high a percentage as 90 of those attacked were removed to hospital. The same result was obtained if groups of towns were taken instead of individual towns, while in addition it could be seen in some cases where hospital isolation was not provided to the same extent as in others, the position of those towns in regard to scarlet fever was even better. In certain places, too, it could be seen that scarlet fever was more prevalent after isolation had been practised than before; but on the whole the many isolation hospitals all over the country had not that result in diminishing the disease that would naturally have been expected after a considerable period of trial, and this, too, with the increase of preventive measures outside the hospitals as the standard of sanitation was gradually raised, and also in spite of the increase of public education as hospitals and sanitation increased. He had, after prolonged and minute inquiry, as indicated by the diagrams and tables displayed that evening, come to the conclusion that the isolation of scarlet fever patients had failed to materially reduce the prevalence of the disease, and that it had failed also to reduce its fatality, while in some towns there was some reason to fear the fatality of the disease had even been increased. His object in reading the paper was to draw attention to the facts, whatever construction might be placed upon them, and how important it was to arrive at some sound and safe conclusion could be imagined from the many expensive schemes for isolation hospitals which were being carried out in many parts of the country. The argument that the system had not been given a sufficiently thorough trial, would not hold good, when it could be seen that towns which isolated most thoroughly were now no better off as regards the disease than those towns which isolated less. One explanation given was that the spread of the disease was due to unrecognised cases; no doubt such cases did play an important part in the dissemination of disease, and it would be a good explanation why the disease was not entirely stamped out, but these unrecognised cases would not explain why this disease remained as prevalent as ever in spite of from 80 to 90 per cent. of all recognised cases being isolated. They were forced to turn to hospital isolation to see if there were any flaw in the system itself. The theory of isolation in hospitals appeared to be sound, but it would be admitted that isolation in a hospital was not by any means the same thing as isolation at home. It was, as Dr. Marriott had recently pointed out, aggregation rather than isolation; and this aggregation had often reached a high point. Was it not conceivable that this aggregation had been productive in ways hitherto hardly suspected of evils which have to a large extent, if not entirely, neutralised the good which otherwise would have resulted from isolation? Speaking from his own hospital experience, he could say there was nothing very improbable in that; indeed, at the moment it was the explanation which seemed to him to have most claim for consideration. In the occurrence of "return cases" they had positive evidence that infection was sometimes carried from the hospital and spread outside, and these "return cases" did not represent the full extent of the evil, because such cases were defined to include only those cases occurring in a household to which a discharged patient returned. Doubtless infection which appeared to be contracted in the ordinary manner was at times due to infection from hospital. It was generally admitted that the fatality of "return cases" is higher than primary cases; if so it was a significant fact, and showed that infection carried from a hospital is more virulent. Was it possible that by aggregation a scarlet fever of higher fatality and more persistent infectivity had been produced—that they had obtained a "hospitalised strain" in our scarlet fever? Such a condition would account for the continued prevalence of the disease in spite of all efforts to reduce it. He was aware that if this theory were correct it would constitute a tremendous indictment of the whole system of hospital isolation of scarlet fever as has hitherto been carried out. That was an unpleasant thought, but in view of the facts and the *primâ facie* evidence there was a case which called for investigation. There had been no full official inquiry into the subject for twenty years, and yet fresh hospitals were still being built on the old lines as if the whole system had been a complete success, and had accomplished all it was originally expected to do (Applause.)

A long and animated discussion ensued, and Dr. Millard was warmly thanked for his paper, the preparation of which must have entailed immense thought and labour.

The Fire Brigade Committee of the London County Council proposes to adopt a sliding scale of penalties for chimney fires. For houses of which the rateable value does not exceed £20 a year, the sum, they think, should be demanded is 2s. 6d., rising to 5s. for values up to £30, 10s. up to £40, 15s. up to £50, and £1 for values beyond. Under the General Powers Act of last year the Council can recover an amount not exceeding £1 as a civil debt from the occupier.

THE INSTITUTE OF SANITARY ENGINEERS

(Incorporated).

OFFICIAL TRANSACTIONS.

NEW YEAR'S PRESIDENTIAL ADDRESS.

Gentlemen,—My first duty is to wish you all a happy new year, and I trust that the present and coming years of the century we have just entered upon may be prosperous to each member individually, and also to the Institute, that not only may the number of members increase, but that there may be a continuance of the good work which has been done in the past.

I have next to most cordially thank the members of the Institute for placing me in the presidential chair, and to express my appreciation of the great honour that has been conferred upon me. I have succeeded some most able men, and I feel certain that in the future equally able men will occupy the position I now hold.

The fact that I was resident so far from the head-quarters of the Institute, and the consequent inability to attend the meetings as regularly as I should wish, made me hesitate somewhat in accepting the honour, but I felt assured that the Institute would not suffer owing to the able and enthusiastic Council by which the business of the Institute is so admirably conducted. Under its earnest and careful guidance the Institute is destined to exercise considerable influence in furthering sanitation in all its branches, more especially in the construction and arrangement of buildings, works, or appliances devoted chiefly to sanitary requirements. Since receiving the appointment of president I noticed a paragraph, in one of the weekly papers, which was devoted to discussing "What a Sanitary Engineer is," and taking exception to a Medical Officer of Health being connected with an association of (whatever they are) Sanitary Engineers.

In the first place, the term Sanitary Engineer appears to me to need little explanation. The term Military Engineer is one well known to apply to an engineer who devotes himself chiefly to the construction and superintendence of works for offence or defence. A Mining Engineer is one employed in the construction or working of mining undertakings, and a Sanitary Engineer similarly denotes one who devises plans for the construction of sanitary works or appliances or who is employed in superintending the working of the same. The arrangement and working of sewerage schemes, hospital construction, and the fixing of various sanitary arrangements are among those matters which come under the supervision of sanitary engineers. Without speaking of my own qualifications for the office of president—a matter which your Council has already taken into consideration—it must be acknowledged that the great improvements which have taken place during recent years in erections and appliances devoted more especially to the advancement of sanitation have been the result to a very large extent of the recommendations of Medical Officers of Health. Than your late president I think you could not have a better example of what a sanitary engineer is. His connection with sanitary improvements in the town with which he was so much associated was most intimate, and very many of the conditions which exist in that town to-day are due directly or indirectly to his suggestion and foresight. I feel bound to refer with regret to the loss this Institute has sustained by his death. That he was possessed of considerably more than the average share of human ability, I think the position he attained to in the architectural and antiquarian world was a proof, and the advice he was ever ready to give could always be relied upon as sound and thoroughly practical. His influence was exceedingly wide and extensive, and many districts are reaping the benefits of his advice given in a private or unofficial capacity.

For this institution he had a very warm feeling, although he only became acquainted and connected with it late in life. His chief hobby or interest was, however, the Order of St. John of Jerusalem, of which Order he held the highest position he could attain, viz., a Knight of Justice; and in the work of this Order, the St. John Ambulance Association, and the Eye Hospital at Jerusalem, claimed a considerable amount of his time and attention.

In a meeting of such an institution as this, at the commencement of a new century, one can hardly refrain from looking back to the progress made in sanitary engineering during the century that has just gone, and the great strides which have been made in our knowledge respecting sanitary matters during the years contained in it. The advance has been made chiefly in the latter years of the century, but the earlier ones were occupied in the study of matters, such as "Microscopy," which paved the way for this advance.

The knowledge of diseases carried by water, or air, and milk, and the influence of soil upon disease, are matters of which we knew nothing before the past century.

The knowledge and practice in the earlier part of the century in respect to house sanitation may be gauged by the position, construction, and arrangements of the older houses in our towns and villages, which so frequently require our attention from some insanitary condition or from their endemic relation to disease.

The disposal of sewage and the construction of works for that purpose are perhaps the latest problems in sanitary engineering, and the difficulties connected with the housing of our rapidly-increasing working class communities will afford matter for discussion and thought for some years to come.

One sanitary provision has seen during the past century many changes and a gradual improvement in its construction, viz., the ordinary closet, or apparatus for containing or collecting the excremental matter from our houses; and as a new form of closet is now coming into use in many of our larger towns, I have to-night chosen to give my experience of the working of the comparatively recently introduced waste-water closet.

Probably the earliest record of any bye-laws relating to the disposal of excremental refuse is in the Mosaic Law, where you will find enacted that each one who wishes "To doe as neede and nature hath vs taught," must go outside the camp, dig a hole with a spud (attached to his spear) and after use cover over the same with soil before going back to the camp. The nomadic conditions of the camps and the sparse resident population allowed this course to be adopted, and it cannot, under these conditions, be looked upon as anything but in accordance with sanitary principles. It is really earth treatment with the largest possible supply of earth. We find that many savage tribes have special places in which their midden heaps are situated. These heaps are used for certain periods and then covered with soil, on which rank vegetation quickly grows.

The next stage of disposal appears in conjunction with drainage construction, for we find that in many of the fashionable cities of history, notably in Rome and Athens, probably Babylon and Egypt also, very elaborate systems of drainage were constructed, and there is no doubt that a form of water-closet was in use in some of these cities. For centuries after this period, however, conservancy methods were those adopted, not only in this country but in most other civilised ones.

The earliest form of closet was a simple pit in the ground, similar to those used by ancient and uncivilised tribes, which was kept in use until full, when it was covered over and a fresh one dug. Next a cross bar was placed as a rest for the person using the receptacle, and in course of time the pit was enclosed by walls and covered by a roof, ensuring both privacy and protection from the weather.

Up to this condition the receptacle was simply a hole in the ground, partially emptied at intervals as it became full, and a greater part of the liquid contents draining away through the surrounding soil, often to a neighbouring well or watercourse. The cesspool was then lined and floored with bricks, purposely arranged to allow free drainage between them, and it is only in a comparatively recent period that water-tight receptacles have been insisted upon. As a further development of the water-tight closet, the removable pan or can made its appearance, and under these conditions we find the closet of to-day. The water-tight cesspool we find in so many continental cities. They are emptied at regular intervals by an air-tight force or suction pump, and in a less complete condition we find them in this country also. With the movable receptacle the closets of many of our large towns are generally supplied—either in the form of tubs, cans, earth-closets, or other variation of the system. Though all, I think, at the present day are willing to admit the superiority of the movable receptacle, with frequent removal, over the old cesspit—even if a water-tight one—there are a great number who will not admit that the other form of sanitary convenience, viz., the water-closet, has any advantage over the pan closet, and some who even consider that the water-closet has distinct disadvantages which the pan system has not. Though, as I have said before, the Romans and others had probably some form of water-closet, the earliest described in this country was about the year 1600, when Sir John Harrington invented one for his own use.

The general use, however, did not commence until the beginning of the century which has just passed, or a few years before it commenced. There were in the early part of the century very few houses to which they were fixed, and the reputation which they gained has not always been a satisfactory one—due to a faulty construction and bad workmanship in fixing—and it is only in the latter decades of the century that these appliances have been properly constructed and suitably fixed. I think you will all agree that the water-carriage system of removal of refuse of an excremental nature from the neighbourhood of our dwellings has, in most respects, great advantages over any of the conservancy systems.

There are few now-a-days who would not prefer, at any rate in the house in which they reside, the water-carriage system, and every investigation of which I am aware tends to prove that the water-carriage system has in connection with it a lower death-rate than the dry system. The greatest advantage is the quick removal of the waste material from the neighbourhood of dwellings, and in consequence the removal of a common source of certain infective diseases. The soil round and near the receptacle does not become contaminated, as is so frequently the case when either cans or other similar receptacles are employed.

When cans, earth-closets, &c., are properly made probably there is little soil pollution, but even when the greatest care is exercised some of the contents are spilled when the receptacles are being changed or emptied, causing surface pollution, and in all that I have yet seen there are corners and hidden angles which are exceedingly liable to become offensive, and they are not to be compared, even when most favourably constructed, with the simple condition of the best water-closets, every part of which can be reached for the purpose of cleansing. Even when the conveniences are themselves satisfactorily constructed and maintained, the retention of the putrescent material near to dwelling-houses is itself a danger to health.

(*To be continued.*)

The Haverfordwest Town Council has decided to borrow the sum of £1365 for paving works.

SEWAGE TREATMENT AT BOLTON.

The following report on the management of the Bolton sewage works has been made to the chairman and members of the Scavenging and Sewage Committee of the Bolton Town Council by the engineers, Messrs. Hinnell and Murphy. A diagram was appended, showing the amount of oxidisable matter contained in the raw sewage, tank effluent, and filtered effluent as compared with the standard adopted by the River Authorities, also the daily sewage flow and amount of sludge formed and the varying degrees of purification effected by the treatment of the sewage. The report states :—

In completing our supervision of these works at Hacken and Rhodes Farm we beg to report upon the same to the end of last year. Since our half-yearly report of July last, the quantity of sewage treated for the six months ending December 31st has been 960, 832, 844 gallons, and the quantity of liquid sludge formed and dealt with has been 24,680 tons.

We have experienced much difficulty in dealing with tank effluent at Rhode Farm in consequence of the amount of solids in solution it contained caused by the liquefaction of the sludge in the settling tanks. With the completion of the sludge-pressing installation, however, it will be possible to deal with the sludge formed weekly and enable the tank effluent to be sent down to Rhodes Farm filtration works in a much lighter condition in the future ; the works can also be much better maintained, and at considerably less cost when the additional tank accommodation as proposed is provided. During last year we are pleased to report that we were able to reduce the amount and value of chemicals used to about one-half, viz., from £1400 to £700, and the extent of purification of the sewage has been fully maintained.

During the last six months we have made 234 tests according to the general formula of the Joint Rivers Committee, and it is satisfactory to note that of this number 222 are under the standard of purification adopted by the Joint Rivers Committee, and only twelve slightly above that standard. The amount of purification effected in the organic matters contained in the sewage has averaged 88 per cent., as shown by the testing of the Rhodes Farm effluent.

The revenue obtained from the sale of produce grown upon the farm for last year will probably amount to £400, and this might have been doubled or trebled if live stock had been kept upon the farm to consume the produce which had necessarily to be cultivated to prevent the land becoming rank or sewage sick.

The filtration plots, having a deep subsoil of coarse gravel, we have utilised as bacteria beds for the night flow of tank effluent, and these, with an occasional turning over of the surface, have produced satisfactory results.

We regret that no diminution of tannery and other refuse waters has yet been made, but if anything the quantity delivered to Hacken Works has increased, and we must again express our conviction that the continued success of the works is jeopardised by its admission into the sewage flow.

In concluding this report we wish to acknowledge the great attention and consideration you have afforded in enabling us to so far complete your sewage purification works as to effect the purpose for which they were designed at a minimum of cost and attention.

The capital expenditure upon sewerage and sewage works for the borough of Bolton in proportion to the population is still considerably less than other Lancashire towns, and the efficiency of your sewage purification works is still far superior to the results obtained

from sewage works of other large towns. We feel sure that it must be gratifying to you to know after acquiring Rhodes Farm that recently Leeds has determined to spend £700,000 upon a conduit and land filtration works after experimenting for three years with bacteria beds. Birmingham are now increasing their present sewage farm by 400 acres, and Nottingham are spending about £335,000 in extending their sewage farm, as successful purification with land treatment at these places has become assured owing to careful and judicious management.

CORRESPONDENCE.

(*To the Editor of* THE SANITARY RECORD.)

(*We do not in any way hold ourselves responsible for opinions expressed by our correspondents.*)

IS AN ENGINEER AND SURVEYOR A CIVIL ENGINEER?

SIR,—I am very interested in reading your admirable comments on the propriety of an engineer and surveyor being entitled to be called a civil engineer. If he is so entitled, it follows, as a matter of course, that he is free to use the recognised abbreviated form, initial letters C.E. I believe, however, you have centred the question when you say, "the matter is one which must be decided by a man's conscience and taste." A reference to extracts from the Charter of the Institute of Civil Engineers may here prove useful. It "was first established, and has since been incorporated by Royal Charter, for the general advancement of mechanical science, and more particularly for promoting the acquisition of that species of knowledge which constitutes the profession of a civil engineer; being the art of directing the great sources of power in Nature for the use and convenience of man, as the means of production, and of traffic in States both for external and internal trade, as applied in the construction of roads, bridges, aqueducts, canals, river navigation, and docks, for internal intercourse and exchange; and in the construction of ports, harbours, moats, breakwaters, and lighthouses, and in the art of navigation by artificial power, for the purposes of commerce; and in the construction and adaptation of machinery; and in the drainage of cities and towns." I think we should all accept the above definition in its entirety, and specific branches of engineering which have been developed during the past eighty years, since the first president, Thomas Telford, F.R.S., occupied the chair in 1820, appear to be provided for by the somewhat comprehensive enunciations in the first part of the Charter. It may be observed that an engineer being a surveyor does not help his case much, as regards bringing him under the above denomination. But if a man has a knowledge of and follows any of the above branches of engineering as a profession—if he is not a civil engineer, what is he?

I am unable to traverse the assertion that an objection to engineers who are not members of the Institute of Civil Engineers using C.E. may have been made, but I doubt if it is a representative view of the whole body, and I know of few institutions whose members comprise men more gentlemanly in feeling and education than those of the Inst. C.E., which is by its Charter a scientific institution and not a trade union. A civil engineer who is not a member of the Inst. C.E. should, I think, be extremely careful not to lay himself open to any suggestion of sailing under false colours; he should bear in mind that his lay brethren may be unaware of any difference between the abbreviations C.E. and M. Inst. C.E. or Assoc. M. Inst. C.E., &c. The user of C.E. should also recollect that his employers may construe C.E. as signifying a profound and universal knowledge of all branches of the profession, or that the user has at one period of his life history been engaged upon bridge building or railway work.—Yours faithfully,

AN ENGINEER.

February 8th, 1901.

STREET CLEANING AND SCAVENGERS.

SIR,—Questions of practical importance are coming before the new Borough Councils in London, and if they are able to bring about an improvement in such matters as the cleansing of the streets they will secure wide and lasting popularity. London is much nearer the sea than Paris, and the Thames is far wider than the Seine, yet the French capital somehow enjoys an ample water supply to wash the streets clean, while in London our thoroughfares are sprinkled just sufficiently to churn up a greasy mud. In Berlin, again, the cleaning of the streets is carried out in a systematic and efficient manner. The street sweepers work in relays—a day and night shift—of twelve hours each, with intervals for meals. Mr. James Pollard, C.A., chairman of the Edinburgh Public Health Committee, and secretary of the Edinburgh Chamber of Commerce, in a work published a few years ago on the municipal government of Berlin, dealing with the cleaning of the streets, writes:

"In connection with this part of municipal work, there is a simple and yet very suggestive matter which strikes the visitor to Berlin who is comparing notes with the state of things at home. It is that the scavengers are all clad in overalls and wide leggings of coarse hempen stuff, which gives them an appearance of tidiness and preserves their ordinary clothes from pollution. With an official cap on his head, a belt round his waist, giving his plain, large tunic a somewhat smart appearance, the Berlin scavenger feels that he is a public servant, and that though his occupation may be menial, yet his health and comfort are of some concern to his masters. The municipality takes no credit for philanthropy in providing these overalls. On economical grounds, which are the only grounds on which any expenditure of this sort is justified, the Corporation do what they can to make their own servants an example to the community in respect of clean habits. Could anything be more consonant with common sense? There can be no doubt that our street sweepers and dustmen daily carry to their homes quantities of dirt and filth which are caught by their clothes in the performance of their unpleasant work. These clothes they wear day in and day out, often for weeks, without being washed. The dirt that is carried home is itself a source of mischief. Dirt makes dirt; and nowhere is it more likely to do so than in such homes as those of our poorer labourers. The Berlin scavenger divests himself of his canvas overalls whenever he reaches home—he may, for the matter of that, leave them behind the door—his ordinary clothes are not soiled and smeared with the dirt of his labour. He washes his hands, face and neck, and is at once in a condition to enjoy his fireside, or to take his wife and children out."

The wages of these men average twenty-one marks per week.—Yours faithfully,

J. LANDFEAR-LUCAS.

Hotel Bristol, Beaulieu, France,
February 4th.

THERE have been altogether ten cases of suspected plague at Capetown. Only one patient is white. The mortality among the rats at the docks began two months ago, and the epidemic spread to the mice in the city. Both rats and mice are now being rapidly exterminated. It was the mortality among these rodents which first aroused suspicion, and led to the detection of the plague.

REPORT ON AN OUTBREAK OF ARSENICAL POISONING IN CREWE IN 1900.

By Dr. Alfred Greenwood, M.O.H. Crewe.

In common with the Medical Authorities of Manchester and Salford, several medical men in Crewe had been puzzled since last August by the presence, in many of their patients, of symptoms of peripheral neuritis, together with other indefinite, vague symptoms which were not wholly attributable to alcohol, but which suggested the action of some other toxic agent.

Owing to the discovery of Dr. Reynolds, of Manchester, that a possible cause for these indefinite symptoms might be in the contamination of beer by arsenic, and the subsequent verification of the same, additional light was thrown on the subject. It was, therefore, with the object of showing to what extent the outbreak of arsenical poisoning affected Crewe that I wrote this article, in my capacity as Medical Officer of Health for that borough.

My first act was, on November 30th, 1900, to send a circular letter to the medical men in the town, asking them if they would kindly bring to my notice any cases which they suspected to be due to arsenical poisoning from beer. In answer to this I received information regarding thirty cases, many of whom I saw.

These cases showed some or all of the following symptoms :—Nausea, sickness, silvery tongue, and irritation of the eyes, followed by a feeling of pins and needles in the tips of the fingers and toes ; the calves were painful on pressure, and afterwards the hands became numb and useless. In most of the cases wasting of the small muscles of the hands took place. Several cases contracted dropped wrist, and an unsteady gait. A marked sign in nearly all the cases was a brownish pigmentation of the skin, very similar to that seen in Addison's disease.

Most of these cases were mild, but in two cases the symptoms were extremely severe. No deaths occurred amongst the Crewe cases, and the symptoms lasted from two or three weeks to as many months in the various cases.

It was found that all the thirty cases were beer-drinkers, and according to the histories—which in alcoholics are generally fallacious—the amounts consumed daily varied from three to ten or twelve glasses. In certain cases, however, there seemed no reason to doubt a history of three glasses of beer per diem, and hence the assumption that as far as this epidemic was concerned the amount of beer necessary to produce such symptoms as tingling in the hands and feet, &c., was much less than that required to produce the same symptoms in ordinary alcoholic peripheral neuritis.

Special inquiries were also made as to the public-houses which were most frequented by these people, and samples of beer, representing the brewers who send beer into Crewe, were taken. These were tested for the presence of arsenic by Reinsch's test. In all I examined twenty-one samples of beer and found arsenic in ten of them, which represented four brewers. Several of the public-houses containing affected beer corresponded with those which were frequented by the sufferers.

A circular letter was sent to all the brewers sending beer into the borough asking them to recall any beer about which there was the least suspicion, and also impressing upon them the necessity of taking every precaution to prevent any beer being sent out which contained injurious material. Every brewer replied and expressed willingness to take all steps which would prevent any further mischief.

A large quantity of beer was recalled, and since December no further cases have come to my knowledge.

Samples of sweets, jam, syrup, &c., were examined and found to be free from arsenic.

The following is a description of the method of performing Reinsch's test:—10 c.c. of pure hydrochloric acid were placed in a flask with 50 c.c. of water, thus making a proportion of 1 in 6. In this were placed four or five thin strips of copper foil, and the whole was boiled for about a quarter of an hour. If the foil is free from film one may assume purity of the reagents for this test. Pour away this fluid and add 200 c.c. of the sample of beer and 33 c.c. of hydrochloric acid, again making a proportion of about 1 in 6. Boil gently for half an hour; pour away the beer and wash the foil with distilled water. Transfer the foil to blotting paper, dry, and heat two pieces in a flat redaction tube and heat. The copper foil will probably be covered with a dark metallic film if arsenic is present, and these form on the side of the tube a little above the foil, which on microscopical examination are seen to consist of octahedral and square crystals of arsenious acid.

Four samples were examined quantitatively, and a description of the method employed appeared in the *Chemical News* of February 8th by Ryder and myself. This method is a combination of the qualitative test above described, together with the method used for the determination of small quantities of arsenic in iron and steel.

The estimated quantities of arsenic in the samples were ·16 grain, ·004 grain, ·01 grain, and ·015 grain arsenious acid per gallon of beer respectively.

I do not propose to discuss the source of the arsenic beyond stating that in the first instance contaminated sulphuric acid had been prepared from arsenical iron pyrites, that this sulphuric acid was employed in making glucose and invert sugar, and that these saccharine substances were used as malt substitutes in the brewing of beer. Nor will I discuss the liabilities of the manufacturers of acid, glucose, and beer, or analysts or retailers, which involve numerous points of law.

On examining the death returns for Crewe during 1899 and 1900 I do not find that there has been any increase in the numbers of deaths from alcoholism, peripheral neuritis, hepatic cirrhosis, and other diseases of the liver and stomach.

Hence the following were the conclusions which were drawn from the above investigations :—

I.—The Crewe epidemic was part of the Manchester and Salford epidemics, since the cases occurred about the same time, and the affected brewers had been receiving their glucose from the same firm which supplied the affected brewers in these two Lancashire towns.

II.—The epidemic was seen amongst beer drinkers only, and beer was the only article found to be contaminated, no arsenic being found in samples of jam, sweets, and syrup which were examined.

III.—Although two cases exhibited very severe symptoms, the mortality of the Crewe epidemic was *nil*.

IV.—The amount of beer consumed in many cases was small, not more than three glasses a day.

V.—The removal of the cause was followed by a cessation of the occurrence of cases, showing symptoms of arsenical poisoning.

An interesting report was made by the Surveyor to the Dover Council last week respecting the provision of destructor cells in connection with the new boilers at the drainage works. The total cost would be £1250. He anticipated it would save £200 worth of fuel a year; also £75 the cost of towing 1000 tons of refuse to sea. The expenses would be £55 wages and £84 interest on loan, so that the net saving would be £136 yearly. The matter was discussed, and then adjourned for a week for details to be further considered.

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The Sanitary Record
AND
Journal of Sanitary and Municipal Engineering.

FEBRUARY 14, 1901.

HOUSING REFORMS IN MANCHESTER.

FROM reports which reach us from the big provincial centres, it is quite evident that the provinces are no less keenly alive to the importance of housing reform than the metropolis. Manchester is naturally well to the fore, and at an influential conference held last week under the auspices of the National Housing Reform Council and other bodies, although there was some diversity of opinion as to the remedy, there was perfect unanimity to the urgency of the subject. The meeting was one with the chairman, who described the housing problem as a burning question, and one that could not long be delayed. Nor were there any dissentient voices raised to combat his assertion that one of the worst features of the question was that a great deal of slum property in our cities was owned by men who were sent to the Corporation to represent the public; while one of the greatest difficulties in obtaining an alteration in slum property was due to those immediately interested who were at the same time acting in a representative capacity on Town and City Councils. If sanitary officials throughout the country would only speak their minds, there is not the slightest doubt we should have an equally powerful indictment from them to the same effect. In paying a deserved compliment to the Manchester Corporation, the chairman complained that they did not move rapidly enough. But he explained that the Sanitary Committee was considerably hampered and restricted by the conditions under which they had to administer the law. But slum property, he pointed out, could be condemned and compulsorily closed, and that was the line which they proposed taking. The purchase of land, by compulsion if necessary, he advocated; but the building of houses for the people on the barrack system he deprecated. One of the Councillors, who moved a resolution urging the Local Authorities to use the powers they possessed under the Housing of the Working Classes Act, 1890, said that the difficulty which arose in clearing insanitary areas was that, in closing those houses, they brought about a condition of things generally worse than prevailed before. He also objected to barrack dwellings, but admitted that where such dwellings had been erected a healthier state of things existed. One noteworthy fact cited by the speaker was that there were no building bye-laws in operation locally to prevent builders constructing a house any size they liked, and the consequence was — much the same as it is in the suburban districts of London — that birdcages were built with a view of getting as much out of the transaction as possible with the least possible expenditure. The discussion which followed produced opinions more or less in harmony with the foregoing. One speaker believed that cheap exit from the crowded cities by means of electric power would help matters. Another advocated wholesale confiscation of insanitary property by the Government. The unification of building bye-laws throughout the country was also put forward. A Salford councillor aired the view that the land question was at the root of the housing question, and maintained that greater attention ought to be paid to the quality of the land upon which houses were built. When dwellings were built on rubbish and ashpit heaps it was no wonder that disease and deaths resulted. The taxation of ground values was supported by another councillor. A clergyman present expressed himself opposed to taking people out of the cities into the suburbs, as it only meant trans-

planting the evil thither. Another clergyman thought that if the poor could be got to take an interest in living a cleaner, healthier, and happier life, it would go a long way towards improving the housing of the people. The meeting did not, however, confine itself to mere speechifying, and the formation of a strong local Council resulted. From this and other signs, Manchester would seem to have put its hand to the plough in real earnest, and there must be no turning back. As one of the speakers said, the great drawback to reform is the apathy of those for whom the reform is intended. But there is equal danger in the apathy of those upon whom the duty of pressing home reform devolves. This is a truism that the advocates for housing reform must bear in mind. Apathy in mankind is like rust in machinery, it corrodes the best impulses and dulls ambition. Vigorous and sustained action alone will lead to the desired results.

Spread of Small-pox in Scotland.

The outbreak of small-pox in Scotland continues to spread, and to occasion grave concern to the Health Authorities. Cases are reported from a large number of districts, mostly in the western and central counties, but the wide range which the outbreak has attained can be appreciated from the fact that the disease has also appeared in places so widely separated as Dundee, Fifeshire, Morayshire, and Dumfriesshire. Everywhere the sanitary officials are exercising the utmost vigilance to check the further spread of the epidemic. A very large proportion of the cases in other districts can be traced to Glasgow, where, notwithstanding certain fluctuations in the returns from day to day, the increase in the number of cases has been steady. Dr. Chalmers' weekly return for the week ending last Friday showed 121 admissions to hospital, 51 dismissals, and 12 deaths. The number of cases in hospital was then 456, which was slightly lower than the number for the immediately preceding days. In the course of a discussion of the subject at a meeting of the Corporation, Mr. Dick, the Convener of the Public Health Committee, made an interesting statement as to the precautions adopted by the Sanitary Inspectors to preserve themselves from infection when visiting the small-pox wards and houses where infectious disease existed, the success of which was evidenced by the fact that during a period of twenty-five years no case was known of infection having been carried by the men to their own families. A petition by the Inspectors for extra remuneration for re-vaccination work came up at the same meeting, but Mr. Dick explained that the right to such extra payment was already recognised by the Health Committee. The request, it appears, had erroneously been incorporated in a petition for overtime pay in connection with the additional pressure occasioned by the presence of the plague in the city during the autumn.. This request for plague overtime was, after a warm debate, refused on the ground, we understand, that it was "ordinary overtime," a reason which hardly appears very satisfactory.

The Arsenic Scare.

The recent unfortunate experience of Manchester of the wholesale poisoning of people by arsenic in beer has made some persons all of a sudden most unduly nervous. Arsenic is now hunted for in every article of food and drink with a sedulousness that has not been known for years. But the search for the poison has been carried out in Paisley with apparently greater zeal than caution. Half a dozen prosecutions at the instance of the Local Authority were brought before the Sheriff Court last week, in which two firms of grocers, and four druggists—the latter comprising three doctors—were charged with selling ground borax which was alleged to contain arsenious acid. When the cases were called, however, the Fiscal asked leave to withdraw the complaints, as it had been discovered that the analyses were erroneous. It was a very unpleasant position for a prosecutor to find himself in. The solicitor for the respondents pointed out that the burgh analyst's results had been checked by other experts, and in every case in which they had an opportunity of checking the analysis they had found it to be wrong. In three of the cases submitted no arsenic could be discovered, and in a fourth there was only one-fifteenth part of the quantity of arsenic alleged in the certificate. It was undoubtedly a very serious error. The position of a public analyst is a most responsible one, seeing that his certificates are the foundation on which charges of a criminal character are based, entailing the gravest consequences. The evidence in the Manchester inquiry showed that there is considerable laxity on the part of some analysts in their conception of their functions. It is to be hoped that any tendency to looseness of practice in so vital a matter will be checked after the object-lesson afforded by Manchester.

Notification in Kilmarnock.

Very strained relations have sprung up between the Medical Officer of Health for Kilmarnock and the Public Health Committee, on account of the former's refusal to send to hospital certain cases, which had been notified as infectious, having given rise to complaints. Whatever may be the merits of the dispute, of which we have no knowledge, the Medical Officer's conduct appears to have been certainly indiscreet. In a strongly-worded letter to the Committee, he not only described local doctors as working the half-crown notification fee as far as they could—which might, of course, conceivably be true—but he also indulged in abuse of the Council in terms which can hardly be characterised as other than intemperate. We are all familiar with the weaknesses and occasional follies of Local Authorities, from the metropolis downward, and Medical Officers have often much to put up with at the hands of their civic masters "drest in a little brief authority." Still, a sarcastic allusion to the prayers in churches "that Magistrates and Coun-

cillors might be endowed with wisdom," is neither seemly nor wise. Controversy conducted in such a strain is hardly dignified, and it cannot fail to provoke resentment and personal ill-feeling where there was only friction before. The Kilmarnock Town Council have in this case decided to lay the whole matter before the Local Government Board, and ask them to send an expert to inquire. We trust the result will be to restore peace and harmony in their Public Health Department, for without these efficient administration is impossible.

A Sanatorium at Work.

So much has been written about what is going to be done on behalf of the sufferers from consumption that many may be under the impression that the past has been a blank in this respect. But we have before us a report of what has been done during the last four years in Canada, and it is so good that great hopes may be entertained of what may be done as experience accumulates. It would appear that the National Association opened its first sanatorium in the autumn of 1897, and during the first year 500 consumptives who applied for admittance were refused for want of accommodation, or because they were too poor to pay for the treatment. This fact alone shows how little is being done compared with what should be done for these people. This sanatorium is situated in the Muskoka district of Ontario, near the town of Gravenhurst. The buildings cost about 60,000 dols., and give accommodation to fifty patients. The annual reports show that remarkable success has attended this institution. Home treatment of consumption results in about 99 per cent. of the cases terminating fatally, while in the same climate sanatorium treatment gave the following result for the last three years in that class of patients that remained three months or over:—Of thirty received, six were in the incipient stages of the disease, sixteen were advanced, and eight were far advanced. The result was, four were discharged cured, eleven with disease arrested, seven much improved, six remained the same, and two failed. The report states that many more would have been cured had they remained longer. This great difference between the results of home and sanatorium treatment is therefore due, not to climate, but entirely to the course of treatment. In Muskoka that consists principally in living an outdoor life, and in eating an abundance of nourishing food. Patients are obliged to be outside from eight to fourteen hours a day in winter or summer. Their surroundings are attractive, and suitable recreation is encouraged in every possible way. The outdoor life promotes appetite, digestion, sleep, and tones up the general system. It produces good blood, and this is the great enemy of microbes and disease. Perfect ventilation of all sleeping apartments is also insisted on. During last summer the buildings were filled, and many patients lived in tents. These did quite as well, if not better, than the others, which again shows the value of pure air. It is quite evident if pure air and good food will cure consumption, it will usually prevent its development, and these are facts that the general public should appreciate.

Salt and Snow.

Controversy has been raging during the past week over the methods adopted for clearing away snow from the streets. The disposal by means of "salting" has come in for strong condemnation, but from none more stringently than by Dr. William Neale. In his opinion it is "an abomination and cruel practice, alike to animals and human beings. Many of the omnibus and tramcar companies, I believe, defend the use of salt on the ground that the evils of this deadly slush are less than the injuries and strains which the horses sustain from slipping in the snow. That undoubtedly is the case, but it does not alter the fact that the practice is in itself an evil, particularly as regards human beings. The foot of the horse is well protected by a thick pad. Nature is his bootmaker, and Nature's handiwork is sound and good. So much cannot always be said for the human bootmaker. Just think of the thousand of clerks and poor people who go to work in the metropolis every day, many of them wearing unsound boots, the soles of which are little better than brown paper. Think what happens when these unfortunate people have to wade through the wretched freezing mixture that is always to be found in the streets when there has been a heavy fall of snow, and remember that in the great majority of cases these people have to wear their boots throughout the day. The intense cold that this mixture of snow and salt produces undoubtedly lays the foundation of all sorts of ailments, such as chills, colds, influenza, and pneumonia. There is a general lowering of vitality, and whenever that happens a man is particularly liable to catch any disease that is going about. It is no exaggeration to say that whenever there is severe wintry weather in London many deaths may be laid at the door of this system of using salt to clear away the snow. I am bound to admit that I cannot suggest an alternative system which would be equally rapid and effectual, but what I would urge is this, that if it is necessary to use salt to cleanse the roads and pavements, the resulting slush should be removed as soon as the salt has done its work, instead of being left untouched, as it frequently is, for several days. If that were done the evils of the practice would be at any rate reduced, if not altogether removed."

Something wrong at Cape Town.

There appears to be other matters than the war occupying the attention of the people in Cape Town. Something is wrong with the drains, if we may judge rightly from a paragraph in the *South African Review*. After twitting the engineer on his anxiety to have his name on the Corporation cart, the writer goes on to say that if "Mr. Wynne Robert is to be indulged in this peculiar craze for

self-advertisement, and if he desires to earn immortal fame as a sanitary genius, why on earth doesn't he go the right way to work with regard to the underground drainage system of Cape Town City? The roadways and pavements are being perpetually pulled up and laid down again. While the excavations are proceeding, harmless ratepayers, who never annoy the Town House people except when they call to pay their taxes, are nearly shocked out of their senses by the frightful gaseous abominations which assail them should they pass within twenty yards of the prospecting operations. For a month or two the public were excessively inconvenienced by some mysterious work which was carried on at the foot of the Avenue and corner of Wale-street. The annoyance, however, was patiently borne in view of the prospect of better drains and no smells. But now that this job is finished, what is the result? Why, the effluvia is worse than ever, and the worshippers at St. George's Cathedral have to bear with an olfactory affliction which sadly disturbs their devotional sentiments. In the streets intersecting Adderley-street and St. George's-street, and the thoroughfares above these two arteries of traffic, the state of the drains and the management of the Sanitary Department must be exceedingly defective; and the wonder is that the death-rate is not higher, not only in the crowded residential parts of Cape Town, but in the business centres, where men and women have all day to breathe a fœtid atmosphere for which the Town Council is directly responsible, while the traction engine juggernauts ramble gaily along." This, taken in conjunction with the accounts given in private letters of the crowded nature of the district by those anxious to get into the Transvaal and neighbouring places, tends to the opinion that Cape Town is not at present one of the "Health Resorts of the universe."

Housing Problem in Hongkong.

Last week's mail brought with it a report of a special meeting of the Hongkong Sanitary Board, at which the general condition of the city was discussed. We have not space to give the details of the meeting, but what was said by the various speakers displayed a state of affairs calling for drastic measures of reform. Every phase of sanitary work requires developing in order to meet the growing population, which is fast outgrowing the district and creating a housing problem quite as acute as anything we have at home. One of the speakers asserted that it was common knowledge to every member of the Board how "appalling was the condition of rents in the colony." The poorer classes "are being literally robbed and squeezed out of their food and clothing in order to pay excessive rents. Floors which a year ago were rented at £6 now paid £19." The same causes that prevail at home have helped to bring about this condition. The workers must live near their employment, and the landlords take advantage of their position. Commenting on the discussion, the *Hongkong Telegraph* cites the case of a Portuguese clerk, residing in Kowloon, and who rented a floor at three dollars per month. His rent has been raised from time to time during the last two or three years, until he is now paying twenty dollars a month for the same accommodation for which he formerly paid three. Needless to say, his salary has *not* been increased by nearly 700 per cent. during the same period, and, as he is employed in Kowloon and is obliged to live there to be near his work, and is unable to find cheaper quarters, he consequently feels the pinch severely. It is the same with European houses. In 1898 a house was rented at forty-five dollars per month. When the year's lease expired the tenant was informed that he could keep the house on at seventy-five dollars. On his expostulating he was calmly informed that there were plenty of people willing to pay that rent, and he could either do so or vacate the house. We don't think that anything much worse than this can be found in London. But in Hongkong it is just as it is in the United Kingdom. All can point out the disease, but none can provide a remedy suitable to the case.

MUNICIPAL ENGINEERING & SURVEYING.

CROSS-TABLE CHAT.

It is extraordinary that Local Authorities should continue to manifest such incompetence in regard to dealing with snow after every fall. Some excuse may be given for their unpreparedness and consequent inability to deal with the first snowstorm of a season. But when a second and a third fall comes, and each time the Authority is in a hopeless muddle, and the footways and roadways are not cleared for some days, then a charge of incompetence against them is justifiable. And this is just what is being done, and rightly so, against many Authorities at the present time. I do not see how it is possible to avoid laying the blame on the Surveyor to the Authority. The public censure should be taken by him as appertaining to his department unless he can show that he is restricted as to expenditure, and this rarely happens. It may be taken for granted that I should not fasten the responsibility upon him unless I had very sufficient grounds for doing so. But it is to his ultimate good that I should be candid towards him. And the way in which numerous surveyors muddled through the task of clearing the roads in the most recent snowstorm was not worthy of them. I pointed out recently how in some districts the difficulty was met by clear-headed and capable surveyors who had prepared their programmes before winter set in, these programmes being printed and placed in the hands of all their foremen and sub-foremen, and who fell in to the work allotted them and cleared the roads with an alacrity which excited much favourable criticism. And what could be done in these districts could be done in all districts with the exercise of foresight, business capacity, and intelligent supervision.

I have observed that some surveyors allege that the cost of carting away snow from macadam roads, even in residential and business streets, is not justifiable, and that it should be left to disappear by the influence of the atmosphere—*i.e.*, by thawing. This opinion is one which cannot be supported, except as regards rural roads, where vehicular traffic is slight, or where a rapid thaw sets in. But when the snow is allowed to lie on the road for a number of days, as recently, and melting

is effected only under the sun's rays, the saturation of the road surface is so great as to transform it, under vehicular traffic, into a sea of puddle, and under such conditions the wear and tear upon the road is—I think every experienced surveyor will admit—incalculable, and the damage caused to it and cost of cleansing is greater than the cost of carting away the snow.

Municipal surveyors do not generally seem to be aware that they are prohibited under the Act of 1875 from receiving payment from their own Local Authority, for extra services rendered in the form of a percentage on the cost of work executed under them, as this constitutes an interest in a contract and is contrary to the provisions of Section 193 of the Act. It frequently happens that a surveyor is asked to undertake duties outside those prescribed at the time of his appointment, such as the preparation of plans for making up roads under the Private Street Works Act, 1892; or of important schemes of sewerage or water supply; or of architectural work, and for which extra duties his Authority are willing to pay him a commission on the cost of the work or amount of the contract. It should be generally known that a payment in this form, if received by the surveyor, may render him liable to the penalty of £50 and loss of office as provided by the section beforenamed. He should therefore ensure that his Authority's resolution protects him against possible proceedings for the recovery of the penalties, and that such resolution provides for a payment by a lump sum—equivalent it may be to that which would be earned if paid by commission. The well-known case of Whiteley *v.* Barley, where the local surveyor was successfully sued for the penalty of £50 and precluded from afterwards holding any office under the Act, should be borne in mind.

I MENTIONED some time ago that a new device for lighting incandescent burners in street lamps would be shortly put on the market. By this device the necessity of a pilot light is abolished, and the gas is lit with the torch-rod, but without the latter entering the lantern. Immediately under the lantern is constructed a small metal box, open at the bottom, containing a lever, which is lifted by the torch-rod, and allows the gas to enter a perforated copper tube which extends to the upper part of the mantle. The gas is ignited in this tube by the torch-rod, the flame runs up the tube, and also lights the burner. As the torch is withdrawn from the cylinder the lever falls of its own weight, shutting off the igniting gas. It is claimed that by its use a saving of one-third cube foot per hour of gas which is consumed by the pilot light is effected, that flap doors in the bottom of the lanterns may be abolished, whereby the lantern may be made wind, rain, and dust-proof; and that a great saving of mantles may be effected. The apparatus, the price of which is 10s., is the invention of one of the engineers of a large London gas company, is now obtainable from the well-known gas-lighting engineers, Messrs. H. Greene and Sons, 19, Farringdon-road, London, E.C., and is being already generally adopted in some districts, and I would advise those of my readers, who have control of street lighting to purchase a sample for a trial. SENEX.

AT a recent meeting of the Workshops Sub-committee of the Cleansing Committee of the Aberdeen Town Council, the proposed purchase of a refuse destructor was again considered. Several replies from towns where these destructors are already in use were read, and the Burgh Surveyor was instructed to issue a plan and a list of the conditions to be complied with to the various makers of destructors in the country, and to request them to send in offers.

REVIEWS.

"*Journal*" *of the Sanitary Institute.*—The *Journal* of the Sanitary Institute, just issued, contains a long article by Professor A. Celli, of Rome, on "Researches on the Propagation of Malaria and the Precautions to be Adopted in Unhealthy Districts." After describing some of the opinions of other investigators he gives reasons for deciding that the dappled winged gnat known as Anopheles is the propagating agent. He then describes the life history of the insect, and sets out a series of corollaries for the hydraulic engineer, for the sanitary engineer, and for the agriculturist, in which are detailed the steps that can be taken to prevent the multiplication of the Anopheles, and other measures against the spread of the disease. The concluding portion of the paper gives instructions for the self-protection of labourers in malarious places. The paper is illustrated from some of Professor Celli's photographs showing methods of protecting houses and shelters. The same *Journal* contains papers by Dr. Tidswell, Medical Officer of Health, Sydney, N.S.W., and Dr. Kaka, Medical Officer of Health, Karachi, India, on their personal experiences of the plague in Sydney and Karachi, with descriptions of the preventive measures adopted. Some microscopic photographs of the plague bacilli, and dissections of plague-infected rats and guinea pigs, appear in the paper.

National Health Society.

OFFICIAL TRANSACTIONS.

VOTE OF CONDOLENCE WITH H.R.H. PRINCESS CHRISTIAN.—At a special Committee meeting, held on Monday, February 4th, the following resolution was passed:—"The Committee of the National Health Society desire, in the name of the members, workers, and officials of the Society, to express their respectful sympathy with H.R.H. Princess Christian of Schleswig-Holstein, in the great sorrow which has befallen her Royal Highness by the death of the Queen." This resolution was immediately forwarded to H.R.H. Princess Christian, whose interest in the Society has always been so great, and whose recent kindness in becoming president will be remembered.

IT has been suggested to the Committee that a subscription list should be opened to raise a memorial to our late beloved Queen. The form the memorial shall take will be considered later, and must necessarily depend upon the amount received. It seems especially fitting that as the majority of the workers of the National Health Society are women, they should show their appreciation of the encouragement given to women by her Majesty throughout her reign.

EXAMINATION FOR THE DIPLOMA.—The first half of the examination for the diploma of the Society (Sanitation and Hygiene) was held by Dr. Louis Parkes at 53, Berners-street, W., on Friday, February 1st. Five ladies presented themselves for the examination, and all were successful in reaching the required standard. The names of the successful candidates are as follows:—Miss Georgina Bevan, Miss Irene Cox, Miss Gertrude Looker, Miss Edith Olliff, Miss Lucy Spiller.

HOMELY TALKS AT HOVE.—A course of "Homely Talks" on "Infant Management" is now being held by one of the Society's lady lecturers at Hove. For some time past annual courses on "Home Nursing" and "First Aid" have been given under the Hove

Technical Instruction Committee, so that the present subject is somewhat of a change. At the opening lecture the chair was taken by Alderman Henriques, who impressed upon the audience the vast importance of the subject before them. The instruction given is entirely of a practical nature, and much interest is taken by the audience in the teaching.

Lectures at Berners-street.—The fourth lecture of Sister Katharine's course on "Sick Nursing" will be given at 53, Berners-street on Thursday, February 14th, 3.30 p.m., the subject of the lecture being "Medical Nursing." Practical demonstrations on poultice making, &c., will be given. On Monday, February 18th, 3 p.m., Dr. Cantlie will give a lecture on "Insensibility," being part of his course of "First Aid" lectures at 53, Berners-street, W.

Public Works.

SEWERAGE.

The Kirkby-in-Ashfield Urban District Council is requiring a loan of £1000 for sewerage works.

The Romford Rural District Council has agreed to apply for sanction to borrow £2200 for drainage works.

A Local Government Board inquiry was held at Uttoxeter last week, with reference to an extensive scheme of sewerage and sewage disposal for that place.

Mr. H. P. Boulnois held an inquiry on behalf of the Local Government Board at West Hartlepool recently with reference to the proposal of the Town Council to borrow £26,500 for the second section of the new drainage scheme now in course of formation.

The Hartlepool Town Council has resolved that the Borough Engineer be instructed to proceed with the Whitby-street section of the sewerage scheme, that he have the specification printed and the plans lithographed, and that he afterwards advertise for tenders.

The partial opening of the new sewage works at Salterhebble, on the river Calder, constructed by the Halifax Corporation, took place last week. The site is at the junction of the Hebble Brook with the Calder, and when completed the scheme will cost £60,000.

We understand that the Local Government Board and the Board of Trade have approved of the scheme of sewerage and sewage disposal, prepared by Mr. E. J. Silcock, C.E., of Leeds, for the Rural District Council of Riccall. The works will be put in hand immediately.

At last week's meeting of the Llanelly Urban District Council it was decided to accept the recommendation of the Sanitary Committee to proceed with the Forge drainage scheme with the outfall at the Carmarthenshire Dock, subject to the approval of the Harbour Commissioners.

At Coventry County-court last week the Town Clerk applied for a further month's suspension of the sewage injunction granted against the Coventry Corporation to prevent a further pollution of the river Avon. Mr. Beard said the works were now practically complete. The works at the farm had been finished, and everything was prepared for pumping the sewage on the land. The engineers had twice inspected the river with a view to carrying out work for cleansing it, and their report was in course of preparation. At the end of the month he hoped to make an application for the discharge of the injunction. Mr. Passman, Clerk to the Warwick Rural District Council, said his Authority was satisfied that the end was nearly in sight, and as Mr. Beard's demand was very reasonable, he would offer no opposition. His Honour Judge Ingham granted the application.

At the last monthly meeting of the Colchester Town Council it was resolved to apply to the Local Government Board for sanction to borrow £10,000 for the extension of the sewerage outfall works, the construction of filter beds, and the provision of additional sludge plant; and, further, to borrow £9000 for the construction of new main sewers for the sewerage of St. Botolph's Valley and Maldon-road districts.

The Orsett Rural District Council has decided upon an extension of the Chadwell and Little Thurrock sewer to the docks, and Mr. S. I. Adams, F.S.I., has been instructed to at once prepare the necessary plans, sections, and estimates on the lines of the plan submitted by the Dock Company at a remuneration of 2½ per cent, inclusive of all charges, except quantities, and a further 2½ per cent. for supervision when the work should be proceeded with.

At a recent meeting of the Gorton Urban District Council the minutes recorded that at a special meeting of the Sewage Committee it had been resolved to apply to the Local Government Board for sanction to borrow £17,700 to cover the cost of further sewerage and sewage-disposal works within the district, £2750 to carry out certain works of surface water drainage, and an additional £3000 to defray the expenditure on sewerage and sewage-disposal works already completed. The minutes were confirmed.

At a recent meeting of the Water, Lighting, Drainage, and Cleansing Committees of the Dalry Council, a letter was submitted from Thomas Biggart and Co., Limited, Bridgend Mills, giving consent to the laying of sewer through their property on payment of wayleave. Messrs. Biggart made notification that in terms of the Rivers Pollution Act facilities should be afforded them for carrying the liquid discharges from their mills into the drainage sewer. This was granted. The contractor for the work is to lodge the sum of £500 as security.

There has been so much delay on the part of the Portsmouth Town Council in dealing with the defective system of drainage in Portsmouth, that it is satisfactory to note the Drainage and Sanitary Committee has at last decided to make an effort to successfully deal with the problem. The members have passed a resolution recommending the Council to approve the expenditure of £43,200 upon a relief sewer from Somers-road to Eastney, with the assurance that if adopted the scheme will minimise backflooding in certain parts of the town.

WATER.

The Holywell Rural District Council has resolved to proceed with the water supply of Bagillt.

The West Penwith Rural District Council has decided to take in hand the water supply of the parish of Gulval.

Last week a special meeting of Norden District Council was held at Norden, to formally sanction opposition to the Bill which is being promoted in Parliament by the Heywood and Middleton Water Board.

The Local Government Board inquiry into the proposed new regulations of the London water companies was opened on Monday last. Quite an array of counsel were present to guard the interests of the various authorities.

The Burgess Hill Water Company now have a Bill in Parliament, and the Cuckfield Rural Council wants to obtain a purchase clause in that Bill. The Burgess Hill Urban Council not approving of this move has asked the Chailey Rural Council to join it in a Water Board, but the Chailey Council is thinking of supplying its own district with water, so, while willing to help in preventing the design of the Cuckfield Authority, has offered only its "moral support" to the Burgess Hill Council.

THE Buckfastleigh District Council has approved the plans and estimates produced by Mr. Stainthorpe for carrying out the Lambsdown scheme, and has decided to apply to the Local Government Board for sanction to borrow the sum of £5500 for works of water supply.

A LOCAL Government Board inquiry has been held at Colchester with reference to an application by the Town Council to borrow £1800 for works of water supply, and £400 for the erection of cottages on the Severall's Estate. The larger sum is required for the laying of water mains to Old Heath.

THE Desborough Urban Council having decided to oppose the proposed Kettering Water Bill, a meeting of owners and ratepayers was held recently, for the purpose of taking into consideration and determine upon the expediency of consenting to the opposition to the proposed Bill on the part of the Council.

ALDERMAN ALF COOKE, presiding last week at a meeting of the Leeds City Waterworks Committee, reported that 2¾ miles of the new 30in. main from Swinsty to Eccup had been laid, out of a total length of twelve miles, and that the work of laying the high-level 18in. pumping main from Headingley to Bramley was progressing satisfactorily towards completion. He further stated that all the reservoirs in the Washburn Valley were full, and that they were capable of supplying the city for 118 days, as against 114 days at the corresponding period of last year. In Eccup reservoir there were 543 million gallons, with a depth of 41ft. 11in., as against 340 million gallons, with a depth of 35ft. 3in., last year. The total daily consumption, he added, was now 15½ million gallons, as compared with 15¼ million gallons last year.

MR. J. SHAW, President of the Surveyors' Institution, presided on Monday night over a meeting of its members at 12, George-street, Westminster, when a paper was discussed, which had been previously read by Mr. R. E. Middleton, on "The Future of the London Water Supply." Mr. W. Hunter said the true solution of the problem was first to develop and utilise the admirable supply which the natural position of London secured to its inhabitants. He held that the question of water supply ought to be treated on national lines, by which means the claims of all cities and towns and districts could be fairly determined. Whereas the total estimated cost of the Welsh scheme of the London County Council was £37,169,000, that of the Thames scheme, yielding an equal daily supply, was £17,486,000. Mr. Wheeler, K.C., contended that there was nothing whatever to justify the burden and expense of going to Wales for London's water supply at the present time. Mr. B. Ellis denied that Wales could yield an inexhaustible supply of water.

AT the Works Committee of Edinburgh Water Trust last week, the question of the Provisional Order now before Parliament was taken up. A statement in connection with this has been prepared for the Examiner of Committees of the House of Commons. The Committee approved that should the explanation prepared by the convener not be sufficient, the following should proceed to London to meet the Secretary of State for Scotland or the Chairman of Committees of both Houses: Lord Provost Steel, the convener; Mr. A. Archibald, Sir Andrew M'Donald, ex-Provost Wood, the Clerk, the treasurer, and the engineer. The Committee agreed to accept the estimate of Robert Laidlaw of £2530 for additional pipes. The engineer laid before the meeting copies of correspondence with the Peebles County Road Surveyor anent the widening of the bridge at Broughton, where the public road crosses the railway. The matter was remitted to the engineer. The Committee sanctioned the laying of a new pipe in Jeffrey-street.

THE Rochford Rural District Council has resolved to borrow £25,000 to complete the scheme of water supply for the western portion of the district, that sum being in addition to the £3000 already borrowed for the well at South Benfleet.

SHERIFF VARY CAMPBELL has refused to grant the petition presented by the Kelso Town Council under the Lands Clauses Act to compulsorily obtain a supply of water from springs on the farm of Ladyrig for the requirements of Maxwellheugh and the higher parts of the burgh. In a note, his lordship says the probability is that a steady supply would not be secured, and it was a case of penny wisdom. It is understood the Town Council has again approached the proprietors with a view to utilising the water for Maxwellheugh alone, but a section of the ratepayers are strongly opposed to the scheme.

THE Derwent Valley Water Board has deposited for the information of Parliament estimates prepared by its engineer showing the gross and net expenditure which will be incurred in the event of sanction being given to the proposals contained in its Bill for this session. The estimated gross expenditure of the proposed new works is put down at £703,000, of which the single line of railway from Hope Woodlands to Derwent will cost £19,315, and the other works, including the proposed new Derwent reservoir, £683,685. It is, however, estimated that the authorised works proposed to be abandoned, which include the already sanctioned Derwent reservoir, would have cost £441,000. The gross estimate is thus reduced to £262,000, which is the amount given by the engineer as the actual additional expenditure which will have to be met should the Bill receive the sanction of Parliament. To provide for this expenditure the Board will ask for £300,000 further borrowing powers, and "such further sums as may be necessary" to pay the cost of passing this Bill through Parliament, and for the payment of interest on this sum until the expiration of ten years "from the passing of the Act." The usual declaration has been made by the Clerk to the Board that the money required will be "raised upon the security of the revenue of the Board arising from the contributions of the four Corporations of Derby, Leicester, Nottingham, and Sheffield."

THE half-yearly meeting of the Chester Waterworks Company was held at Chester last week. The accounts for the half-year showed a surplus of revenue over expenditure of £2545, and adding a balance brought forward from the previous half-year (after payment of dividends) of £6759, made a total of £9304. The Chairman, in moving the adoption of the report, said, according to the statement of their engineer, the amount of water pumped and distributed during the year 1900 was upwards of 638 millions of gallons, being an increase of 16 millions on the previous year, and showing a daily supply of 36 gallons per head of the population. With regard to the water scare, there was generally such a scare once a year, and he had come to look upon them as good things. The cause of the recent scare was the rainy season, and not any inherent defect in the works. The water had improved very much, and Dr. Frankland, in his most recent report to the Public Health Committee, stated that the samples of filtered water both from the works and the consumers' tap were almost perfectly clear to the eye; they were palatable and contained only a moderate amount of organic matter. The efficiency of the filtration was indicated by the fact that out of every 100 bacteria present in the unfiltered water no fewer than 95 were removed in the process of filtration. The results, both bacteriologically and chemically, were much more satisfactory than on the occasion of his last quarter's examination. Dr. Boyce's most recent report was also very good, and showed that there was an almost absolute absence of anything deleterious.

The Bridgwater Rural District Council has approved of the new water scheme prepared by Mr. Markyn, the engineer, by which it is proposed to take the water, which is required for seven parishes, from springs on the Willoughby estate at Broomfield, the total cost of the scheme being estimated at £30,000.

Last week a meeting of the Lancaster ratepayers was held to consider what steps should be taken in the matter —whether an adequate supply should be provided for Galgate, or whether the householders, &c., were to go on as at present—obtain water from the wells and pumps in the village. It was finally decided to obtain a supply from Thirlmere.

LIGHTING.

The Eastbourne Town Council has made a net profit during the past year of over £300 on its electricity works.

The London County Council has agreed to lend £17,229 to the Hampstead Borough Council for an electric light installation.

The London County Council has decided to lend the St. Pancras Borough Council £830 for the electric lighting of public buildings.

The Conway Town Council has accepted the contract of Mr. R. Dempster for the extension of the gasworks, and for supplying plant, for £5130.

The Electric Lighting Committee of the Hereford Town Council has received the sanction of the Local Government Board to a loan of £5000.

The Newark Town Council has decided to make application to the Local Government Board for sanction to a loan of £30,000 for the purpose of adopting an electric lighting scheme.

The question whether or not Gravesend shall be lighted by electricity was thoroughly debated by the Town Council last week, and ultimately decided in the affirmative. In a report to the Council, Mr. W. H. Trentham, M.I., &c., stated that the cost of providing a generating station for lighting purposes only, including the mains and public lighting, would be £25,000. Working expenses would be £1936, interest and redemption £1438; making a total of £3374.

At the ordinary general meeting of the Chester United Gas Company held last week, the directors reported that after providing interest on loan capital and dividend on preference stocks, a profit remained of £3555, out of which it was decided to pay the statutory dividends on the ordinary stocks, carrying forward a small balance. Owing to the heavy increase in the cost of coals the company had increased the charge for gas 5d. per 1000 cubic feet, and during the quarter had paid over £3000 extra for coals.

The report of the engineer (Mr. George Wilkinson, M.I.M.E., Harrogate), appointed by the Otley District Council to report upon the question of the establishment of a public electricity supply for the town, has just been presented to the Council, and was last week considered by the Electric Lighting Committee of the Council. Mr. Wilkinson's proposals include the establishment of a steam-driven generating plant in a field near the river, capable of providing 6750 8-candle power lamps. He estimates the capital outlay at £18,000, and the annual expenditure at £1122 15s. The revenue is to be derived from the sale of current to 6750 lamps, at 6d. per unit, averaging 7s. per lamp per annum, a total of £2362 10s. Thus the annual gross profit is £1239 15s., and the net profit is estimated at £231 15s. In comparing this scheme with that for obtaining a supply in bulk from the Yorkshire Electric Supply Syndicate, he estimates the total annual expenditure for the latter at £2110 10s., and the receipts at £2250, thus giving a net annual profit in favour of local work of £92 5s.

The annual meeting of the shareholders of the Coatbridge Gas Company was held last week. The directors' report and balance-sheet were unanimously approved, and dividends at the rate of 10 per cent. per annum on the original stock and 7 per cent. on the new shares, 1877 and 1898 issues respectively, were declared. The chairman said the consumption of gas showed an increase of 3 per cent.

The Board of Trade gas returns recently issued, giving statistics for the year 1899, show that in the United Kingdom in that year there were 450 authorised undertakings in the hands of companies and 232 in the hands of Local Authorities, making a total of 682, an increase as compared with the previous year of twenty-one, of which eleven are company undertakings, and ten in the hands of Municipalities.

Col. Makins mentioned at the recent meeting of the Gas Light and Coke Company that the directors had to announce a deficit in the amount required for the statutory dividend to the extent of £71,000. This was due to the abnormal price of coal and the abnormally mild weather, especially during the month of December. He could promise no alleviation in these adverse factors during the current half-year. There could be no reduction in the price of gas, and consequently no increase in the rate of dividend. Looking beyond June 30th the prospect was more satisfactory.

The deputation from Edinburgh, which visited London, Bolton, Oldham, and Brighton last Thursday, reported that the system of providing cooling towers and condensing plant at the electric lighting stations would not be tolerated in Edinburgh. In some places the steam was so great that the deputation had to put up their umbrellas to protect themselves, and as at Macdonald-road the nuisance would be several times multiplied, they recommended that there should be no cooling towers or condensing plant introduced there, but that the waste steam should be sent up an iron pipe at the top of the chimney.

A deputation from the promoters of the Electric Power (Yorkshire) Bill attended before the Sub-committee of the Parliamentary Committee last week, and inquired whether the Sub-committee would recommend the Council to support the Bill. The proposed area of supply of the company comprises that part of Yorkshire lying to the south of the river Aire, and is practically the whole of the West Riding. Some discussion took place on the provisions of the Bill, and when the deputation had retired the Committee resolved to recommend the Council to present a petition against the Bill unless the promoters would exclude the city of Sheffield from its operations. The Sub-committee was, however, perfectly willing to agree to a clause being inserted, authorising the company and Corporation to make an agreement for the supply of electricity in bulk to the Corporation if it should require it.

GENERAL.

The St. Ives (Cornwall) Town Council has decided to erect new slaughter-houses.

The Acton Urban District Council proposes erecting public baths at a cost of £18,000.

The Hammersmith Borough Council will receive the loan of £2200 for an underground convenience.

An underground convenience is to be constructed in Queen's-square, Wolverhampton, at an estimated cost of £2400.

Another case of small-pox has been reported to the Bradford Medical Officer from the Wyke district. There are now seventeen patients in the hospital at Bierley, but it is not anticipated any case will terminate fatally. Quite two-thirds of the sufferers are from Wyke, and they are all restricted to relatives and neighbours.

The London County Council has agreed to lend the Hackney Borough Council £9750 for street improvement and paving works.

The London County Council has decided to lend £24,145 to the Fulham Borough Council for a dust destructor and electric lighting.

Dr. R. Dudfield, Medical Officer of Health for Paddington, reports that for some years past no infectious sickness has occurred among those living on the canal boats working to and from Paddington.

The Municipal Authorities at Leicester have just opened a large extension of their lunatic asylum accommodation, at a cost of over £100,300. The work was necessitated by the steady growth of lunacy in Leicester.

The new cart-and-pail sanitary system, recently contracted for by the Pietermaritzburg Town Council, provides for the acquisition of five sanitary carts and gear, four galvanised iron slop carts, 7000 night-soil pans, and various tools.

A Local Government Board inquiry has been held at Fareham with reference to the application of the Fareham Urban District Council to borrow £450 for the purchase of a site for an infectious diseases hospital for Fareham.

The outbreak of small-pox in Scotland is becoming serious, for it is reported rife in centres removed over a hundred miles from Glasgow. In Glasgow itself there are twenty-four new cases, making 436 cases in all; but the alarming feature is in the outbreak at Dundee, where ten cases have been found. Six have been discovered at Falkirk. The disease shows an increase at Coatbridge, Airdrie, and Paisley.

The Queenstown Sanitary Authorities have decided that, with a view to the prevention of the introduction of small-pox into Queenstown, Cork, or the South of Ireland, all ships and steamers arriving at Queenstown from Glasgow shall be subject to the regulations in force during the existence of the plague, viz., that the Medical Officer of the port shall visit all such vessels and inspect the crews and passengers on board before *pratique* is granted.

At a recent meeting of the Ilkley District Council it was reported that, in response to an application for power to purchase land for the purpose of a refuse tip, the Local Government Board had replied that it would be preferable for the Council to provide a destructor, and as it seemed that it was only proposed to tip the refuse on the land which it was desired to purchase as a temporary measure, the Local Government Board requested the Local Authority to reconsider the matter. It was decided to reply that considerable difficulty had been experienced in trying to obtain land for a destructor, and that the purchase of this land was the speediest way out of a pressing difficulty.

At the next meeting of the London County Council the Public Health Committee will seek authority to spend £50,000 on measures of precaution against plague. For the purpose of isolating "contact" and "suspected" cases, London is to be divided into four divisions with accommodation for both classes in each. Premises are to be fitted up for use as isolation homes at a moment's notice—that is to say, they will be stored with food, clothing, and the necessary appliances. Preparations will also be made for (1) further accommodation that could be got ready in a few hours; and (2) still further accommodation that could be got ready in a few weeks. The £50,000 will cover all cost in connection with 1000 "contact" cases and 100 "suspected" cases. Cases of pneumonic plague—a highly infectious and very fatal type—have recently occurred in Hull. "These cases," say the Committee, "following so soon upon the cases of bubonic plague at Glasgow, emphasise the importance of taking every precaution against the disease in London."

The Health Committee of the Sheffield Corporation has had before it tenders for the erection of a new destructor in Penistone-road, and it was agreed to recommend the Council to accept a contract for £33,000.

The Town Clerk of Crewe has received a communication from the Light Railway Commissioners, stating that they had decided to refuse to sanction the Council's request to borrow money for the laying down of electric railways in the borough and surrounding districts.

The Leicester Town Council has unanimously decided to purchase the undertaking of the Tramways Company and work it under its statutory municipal powers, and supersede the present horse power by electric traction. Roughly estimated, the cost of the scheme is over half a million.

The Baths and Washhouses Committee of the Islington Council reports that in order to complete the artesian well installation at Hornsey-road Baths authorised by the late Vestry it would be necessary to have additional steam and exhaust pipes, hot well, donkey pump, iron ladder to wells, and that Messrs. C. Isler and Co., the artesian well engineers, had agreed to provide this additional machinery and plant for a net sum of £241 10s. It would be also necessary to fence round the wells and machinery at an estimated cost of £30, and this with an allowance of £23 10s. for contingencies, would bring the total cost of this additional work to £285. The expenditure was approved by the Council.

On Tuesday next the London County Council will be asked to approve two large estimates for the conversion of the tramway system from horse to electric traction, one sum of £145,000, another of £478,000. The first is for buildings and a railway siding, and in this case repayment may be spread over sixty years. The second is for lines, machinery, generating plant, rolling-stock, and electrical equipment, the sum being repayable in twenty-five years. It is proposed to construct a generating station of sufficient capacity to supply electric energy for all the Council's South London tramways; but at present only the following lines are to be adapted (for the underground conduit system):—Those (*a*) between Westminster Bridge-road and Upper Tooting-road, (*b*) between Kennington Park-road (at its junction with Kennington-road) and the terminus at Blackfriars-road, and (*c*) between St. George's Circus and the terminus in Waterloo-road.

We alluded, says a Leicester paper, to the ways of diphtheria last week as past finding out. But the latest return of the Medical Officer shows that the bewilderment must be extended to the entire public health. The latest figures are, indeed, nothing if not paradoxical. On the one hand, we find that local mortality has tumbled down from 68 to only 41, or by no less than 27, at a swoop. On the other we are confronted by a leap from 16 to 26 in the fresh notifications of diphtheria. One consequence is that Leicester—according to the Registrar-General—runs Burnley closely for the blue riband, as returning the smallest death-rate of any large centre in the kingdom, our proportion being 10·2, as compared with the minimum of exactly 10. Another is that the borough once again figures, nevertheless, as being still in the midst of its now long-protracted epidemic of diphtheria. Even this, however, must be by no means alarming, seeing that it does not prevent Leicester from registering only two deaths to every three recorded even in the "Queen of Watering Places"—Brighton. What is the key to the remarkable decline in the death-rate, side by side with another leap in the epidemic? Several may be suggested. The more probable is the tale told by the fact that the deaths from pulmonary diseases and consumption fell during the past two weeks from no fewer than 21 to only nine.

The Worcestershire County Council has set on foot a movement to establish a hospital in the county for the open-air treatment of consumption, and it is thought Lickey Hall would be a suitable site. A conference was held at Worcester on Saturday, and it was decided to invite the co-operation of all the Poor Law and Sanitary Authorities. A large and representative Committee was appointed to take steps in the matter.

Last week, in submitting the estimates of the Hull Sanitary Committee for the coming year, the Chairman observed that they were the highest submitted to the Committee during his experience; in fact, he did not think there ever had been any bigger estimates. They included an item of £15,562 for night-soil and dry-dust collection, &c. The wonderful growth of the city necessitated the best sanitary arrangements, and he pointed out that 1643 new houses were erected in Hull last year. The total amount of the estimates was £30,380, and it would therefore be seen that the night-soil collection was responsible for more than one-half of that amount. Hospitals were put down at £7426, and it would be seen from the particulars that that was by no means an excessive charge. The balance was made up of eleven items, and they were told that they could not do with less money if the work was to be carried on efficiently. With a rateable value of nearly £1,000,000 he did not think £30,380 was too much to spend on sanitary matters. The Committee finally agreed upon estimates amounting to £31,484, instead of £30,380 as originally proposed. The estimate last year was £26,199, but the actual expenditure amounted to £31,991.

PERSONAL.

Dr. Milner has been reappointed Medical Officer of Health for Lostwithiel.

Dr. Donald M'Donald has been appointed Sanitary Inspector for Kintyre, N.B.

Dr. South has been appointed Medical Officer for the Wimborne district of the County of Dorset.

Mr. H. R. Smith, of Plymouth, has been appointed third Sanitary Inspector to the Torquay Town Council.

Mr. W. Curry, of Droylsden, Lancashire, has been appointed Surveyor for the Urban District of Spennymoor.

Dr. G. F. Easton has been reappointed Medical Officer of Health for Alnwick, at a salary of £50 per annum.

Mr. J. Sloan, of Hetton-le-hole, has been appointed Drainage Inspector to the Town Council of South Shields.

It is proposed to increase the salary of Dr. Evans as Medical Officer of Health for Bradford, from £500 to £600 per annum.

Dr. E. G. Annis, Medical Officer of Health for Huddersfield, has been appointed Medical Officer for the Borough of Greenwich.

Mr. George Wallace, Surveyor to the late St. Giles' Board of Works, has been appointed Borough Surveyor to the Holborn Borough.

Dr. Turner, the newly appointed Health Officer for Bombay, left England in the India on the 30th ult., and will enter upon his duties in the middle of the present month. Mr. W. Maughan, Associate Member of the Institute of Civil Engineers, who has recently been appointed Deputy Executive Engineer for Drainage, ordinary branch, will arrive at the end of the month. Mr. Maughan, who was selected from about sixty applicants, has been for eight years in the office of Mr. Santo Crimp, and has been engaged on Mr. Crimp's atest drainage schemes as Resident Engineer.

Mr. W. A. Tester, of Plymouth, has been appointed Tramways and Electrical Engineer for Lancaster at a salary of £300 per annum.

Dr. Caldwell Smith has been appointed Medical Officer of Health for the Borough of Wandsworth at a salary of £800 per annum.

The salary of Commander Wells, the chief officer of the London County Council Fire Brigade, has been increased from £900 to £1000 a year.

Dr. Richard King Brown, of Old Kent-road, has been appointed Medical Officer of Health for the Borough of Bermondsey, at a salary of £500 per annum.

Dr. H. Poole-Berry has been reappointed Medical Officer of Health for Grantham, at a salary of £50, and Mr. James Barnacle, Inspector of Nuisances, at a salary of £45.

Mr. W. A. Collins, of Leyton, has been appointed Inspector of Nuisances for the Bridgwater rural district, at a salary of £140 per annum, in room of Mr. Wm. Coles, resigned through ill health.

Mr. Frank White has been appointed senior Sanitary Inspector to the County Borough of Northampton at a commencing salary of £140 per annum, subject to the approval of the Local Government Board.

Dr. Harris, Medical Officer of Health for the Borough of Islington, is, we understand, a candidate for the vacant post of Medical Officer of Health to the City of London. Dr. Harris has been in his present position about eight years, and has proved himself a most efficient officer.

Mr. J. H. Rider has been appointed electrical engineer of the London County Council at a salary of £1000 per annum. Mr. Riding is at present chief consulting and resident engineer for electric tramways and electric lighting under the Plymouth Corporation. Twenty-five gentlemen applied to the Council for the position.

Mr. Samuel George Burgess, secretary and manager to the Middle Class Dwellings Company, Rowton Houses (Limited), and Wharncliffe Dwellings Company, Limited, was on Tuesday appointed manager of the new Housing Department of the London County Council. The salary in this case has been fixed at £800 a year. There were 117 candidates for the post.

LAW CASES.

Power of Sanitary Officials to Enter Suspected Premises.

The Turriff District Committee of the county of Aberdeen recently raised an action in the Sheriff Court at Aberdeen against Alexander M'Gregor, as the owner and occupier of a dwelling-house in the village of Cuminestown, craving the Court to ordain the defender to admit the pursuers' servants, Dr. James P. Watt, Medical Officer of Health, and Archibald Bell Findlay, Sanitary Inspector, into his premises for the purpose of inspecting the same, and, in the event of the defender failing or refusing to obey such order, to grant warrant to pursuers' servants to enter by force into the premises, and to find the defendant liable in expenses. The petition proceeded on the averments that pursuers believed on reasonable grounds that there existed in said house a nuisance under the Public Health Act, namely, that the house was in a filthy and unwholesome condition, as well as the bedding, clothing, and articles of furniture therein; and that the Sanitary Inspector, along with the police constable, had applied for admission and been refused.

The Sheriff, before granting the order craved, ordered intimation of the petition to the defender, who appeared

by an agent and opposed the application as irrelevant in respect that it was not stated that the premises were believed to be injurious or dangerous to health, or a nuisance to his neighbours, and that they must be one or the other. Sheriff Robertson sustained this objection, but allowed the pursuers to amend the petition to the effect of stating that the premises were injurious or dangerous to health. The pursuers amended accordingly, and the Sheriff then granted the order. On inspection of the premises by Dr. Watt, it was found that no nuisance existed, and the defender thereupon moved the Sheriff to award expenses in his favour. The Sheriff-substitute made avizandum on the question, and has now found the defender entitled to his expenses. The following is his Lorship's note:—I take the broad facts: (1) That expenses were asked against him in the petition, and that, unless he had appeared, they would have of necessity been awarded against him; (2) that the petition was, in my opinion, irrelevant until it was by leave, amended; and (3) that the application has, after all, been found to be unnecessary and baseless, as, on inspection, there was found to be nothing in the condition of the house justifying interference. In these circumstances, and without laying down any rule, I think the defender should have his expenses.

Chemists and the Foods and Drugs Act.

IMPORTANT JUDGMENT ON APPEAL.

Mr. Justice Bruce and Mr. Justice Phillimore, sitting last week as a Divisional Court in the King's Bench Division, gave judgment in the case of Dickins *v.* Randerson, which had been argued previously, this being an appeal by a chemist at Skipton against a conviction by the West Riding Justices for selling mercury ointment not of the nature, substance, and quality demanded by the respondent, who is an Inspector under the Sale of Foods and Drugs Act, 1875.

Mr. Justice Phillimore, in delivering the judgment of the Court, said they thought the conviction must stand. Appellant sold mercury ointment, a drug which was called by that name in the "British Pharmacopœia," and having a certain fixed ratio of mercury. When he was asked for mercury ointment he ought to have sold the drug as prescribed in the "British Pharmacopœia," or if he was going to sell, what he, in fact, did sell—an ointment in which the mercury was only about a quarter of the standard strength, he should have explained that he was selling a weaker or diluted drug, and have so named it. He acted from no sordid motive, but none the less he was in the habit of selling to his customers something which was not of the nature, substance, and quality which they must be taken to have demanded.

It was said he sold the mercury ointment of commerce, and that there was a difference between that and the standard in the British Pharmacopœia. The apellant failed altogether to prove that, and did not even attempt to prove it. What he did attempt to prove was that there were two commercial standards of wide difference, a thing in itself unreasonable, and that he kept both standards in his shop, and sold one standard or the other, according as customers did or did not bring a prescription from a medical man. He might almost as well keep two weights or two measures. The practical mischief of such a practice was pointed out during the argument. If there were any danger on the other side it was avoided by the simple expedient of distinguishing the two drugs by calling the strong ointment mercury ointment, and the diluted ointment mercury ointment weak or diluted, and by recommending the latter to any customer whom he might think unskilled, or likely to use the drug in a dangerous manner. The cases quoted established the fact that if a drug was found in the British Pharmacopœia, and that drug was asked for, must be supplied, and if it was not sold with its ingredients in the proportions prescribed by the British Pharmacopœia there was at least *primâ facie* evidence that what was sold was not of the nature, substance, and quality demanded.

It was argued for the appellant that as the drug in question was a compounded drug, proceedings ought not to be taken under the 6th Section of the Sale of Foods and Drugs Act, but under the 7th Section, and for this purpose some observations of Mr. Justice Wright in Houghton *v.* Taplin had been invoked. The Court thought those observations had been misunderstood. At any rate this was clear, that a compounded drug was none the less a drug, and their Lordships thought that proceedings could be taken under Section 6, though they might also be laid in the case of a compounded drug under Section 7. They entertained no doubt that the appellant sold to the prejudice of the purchaser a drug which was not of the nature, substance, and quality of the article demanded by the purchaser, and so contravened the provisions of the earlier part of Section 6. The difficulty they had felt arose from the provision that such an offence should not be deemed to be an offence under that section where a drug was compounded as in the Act mentioned. It was argued for the appellant that because the article in question was a compounded drug, the sale of it came within the exceptions in Sub-section 3 of Section 6, and constituted an offence not under the Section 6 but under Section 7. The Court thought it constituted an offence under Section 7, and also under Section 6. The exceptions in Sub-section 3 of Section 6 did not apply to all compounded drugs, but only to drugs compounded as in the Act mentioned. It was very difficult to understand the meaning of the words "as in the Act mentioned," as they could find no provision in the Act to which those words would apply; but it seemed impossible to reject the word. They could not read the exceptions in Sub-section 3 as if they were not qualified by the concluding words, although it was difficult to say what was the exact meaning of the words. This, they thought, was clear, that no possible meaning could be given to the words that could apply to the article in the present case. It was certainly not compounded as in the Act mentioned, and the sale of it, therefore, did not fall within the exceptions mentioned. The appeal must therefore be dismissed with costs.

Judgment was entered accordingly.

NOTES AND QUERIES.

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2089.—Bye-laws as to Air Space do not Apply to Old Buildings.—"Surveyor" writes:—"An owner of certain dwelling-houses erected about 1810 is desirous of constructing a small workshop at the rear of his premises. Will you kindly say whether the proposed erection contravenes the bye-laws as to air space? The Model Bye-laws are in force in this district. (2) An owner has erected a green-house at the rear of his premises from his first floor. Does this contravene the bye-laws as to air space? The house was erected prior to the date of Building Bye-laws coming into force in the district? Would the owner be also able to erect a wash-house in his yard?"

Answer.—The Local Authority are not enabled to disapprove the plan on the ground that the proposed building reduces the air space of buildings erected prior to the adoption of Building Bye-laws in the district. The workshop is not a domestic building, and the clauses as to providing air space at the rear of such buildings do not apply. Plans must, however, be submitted to the Local Authority of the proposed building. (2) The Local Authority can enforce the submission of plans for the erection of such a building. They could not, however, refuse approval thereof on the ground that the air space was encroached on, as the existing bye-laws do not apply to houses built prior to their

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adoption. The owner may erect a wash-house on the air space, but he must obtain approval of his plans by the Local Authority before doing so.

2090.—Sewage Disposal Scheme: Power to Raise Money to Defray Cost.—"Engineer" writes:—"We have prepared a sewage disposal scheme which consists largely in alteration to old work. There is no land whatever provided and none available without pumping. Will the Local Government Board be likely to approve the scheme? If they refuse to approve it, would the Council be able to carry out the work by levying a rate instead of borrowing the money?"

Answer. — The Local Government Board do not approve schemes for sewage disposal and treatment unless the effluent is passed over land before being discharged into a stream. The Council may, however, defray the cost out of revenue, or they may in the alternative, where they are possessed of land for the purpose of sewage disposal, borrow any moneys on the credit of such land, and utilise the money so obtained to defray the cost of carrying out any work which they are empowered to do under the Public Health Act—see Sec. 235 of the Act of 1875. This power is free from the control of the Local Government Board.

2091.—Smoke Nuisance: Not Necessary to Specify Work Required.—"X. Y. Z." writes:—"There is a serious nuisance from a large metal works using steam boilers and muffles or annealing ovens. The proprietors set the Council at defiance, claiming exemption under Sec. 334 Public Health Act, 1875. The works are of such a nature as to make it difficult, if not impossible, for any but a skilled engineer to say for certain the actual cause of nuisance, bad construction or negligence, or to advise generally or specially as to remedies. The Inspector advises the Council to take the advice of an engineer or specialist in this class of work. The Clerk avoids the responsibility of advising by taking the opinion of counsel, who advises service of notice to abate the nuisance within seven days. He says that it is necessary to specify on notice the cause of nuisance, or to describe works to be done, or to call any evidence on any point except as to time of emission of black smoke. I advise the Council that under such conditions the prosecution will fail. What do you think?"

Answer.—It does not appear to be necessary in a case of smoke nuisance that the Local Authority should specify what works have to be done to abate the alleged nuisance. In Millard *v.* Wastall, Q.B.D., 62 J.P., 135, where the Ramsgate Urban Sanitary Authority had served a notice upon the occupier, Wastall, to abate a nuisance caused by the emission of black smoke from a factory chimney without specifying the remedy for the abatement of the nuisance, but merely "to abstain at all times hereafter from doing or suffering to be done anything which shall cause the said chimney to send forth black smoke in such quantity as to be a nuisance," and the magistrates dismissed the complaint on the ground that the notice did not specify the works required to be done in order to abate the alleged nuisance, it was held on appeal by Day and Lawrence, J.J., "that it is not necessary for the Local Authority to invent works to be done by the persons by whom nuisances are required to be abated. In many cases such as the present no works are necessary, all that is required is that the defendant should refrain from using such coal as caused the emission of black smoke from his chimney, which was the nuisance complained of. It is much the same as if a nuisance were caused by keeping pigs, the owners must either keep the styes clean or remove the pigs."

2092.—Plumbers' Registration Movement.—"C. A." writes:—"Being a plumber and interested in above movement, can you give me the address of the Secretary of the Sheffield Registration Committees, or could you give me the address of the central Society? There seems to be very little publicity given to the affairs of the company in regard to the movement, and no one appears to know the proper quarter to which to write."

Answer.—We agree with our correspondent that it is difficult to ascertain the particulars required as to registration of plumbers, &c., and we think the company should take some steps to bring to the notice of persons interested their address, which is, The Worshipful Company of Plumbers, 1, Adelaide-buildings, London Bridge, London, E.C. We have several other communications on the same subject from plumbers and others. The secretary will furnish information as to when and where examinations are to be held, and the syllabus of subjects for the examination.

2093. — Carbolic Acid: Sale of, Order in Council. — "M. O. P." writes:—"It is the custom of this Local Authority to supply carbolic acid free to occupants of houses where cases of infectious disease occur. The Inspector has a store of carbolic acid in 8 oz. bottles. Also a cask of crude acid. Will this practice, if continued, be contrary to the new order regulating the sale of carbolic acid?"

Answer.—The order only applies to the sale, and not to the gratuitous distribution of carbolic acid, and does not affect the free distribution of the poison by Sanitary Authorities. It is, however, advisable for Sanitary Authorities to label each bottle with the word "Poisonous," and such bottles should be of special shape, as prescribed by the order, and bear a notification that the contents are not for internal application.

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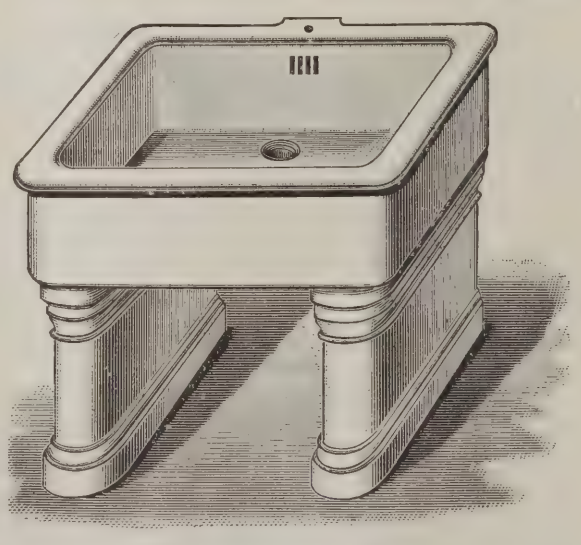

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TUBERCULOSIS—INFECTION, HEREDITY, PREVENTION, HYGIENIC TREATMENT.

By A. G. Young, M.D., Secretary State Board of Health, Maine, U.S.A.[1]

(*Continued from page* 140.)

The children of tubercular homes.—Children in homes where there are cases of consumption, particularly children in the first months of life, are especially subject to the danger of infection, both on account of their feeble power of resistance, and for other reasons now to be mentioned.

The bacilli of tuberculosis, like other bacteria, are forms of particulate matter, and, obeying the law of gravitation in common with other matter, fall toward the earth when unsupported. The gravitation of the bacteria in a room, towards the floor, especially in still air, is more rapid than might be supposed.

Neumann found in the Moabit hospital near Berlin, between half-past seven and eight in the morning, very soon after the patients had left their beds and the wards had been swept, from eighty to one hundred and-forty germs in ten litres of air. At nine o'clock the number had sunk to sixty-eight; between ten and twelve o'clock the number ranged from twenty-two to forty-two; in the early part of the afternoon about twenty. At night, from an hour and a-half to two hours after the patients had gone to bed and the ward had become quiet, there were only from four to thirteen germs in each ten litres of air.

According to Stern, after the dust had been disturbed in a room, and the room is again closed up, the greater part of the bacteria have fallen to the floor in from twenty to thirty minutes. After from one to two hours the air still contains a very few bacteria; leaving the room closed and undisturbed still longer, the air is found almost entirely free from germs.

Thus it results that, in rooms infected with dried tuberculous sputum, the floor serves as the lodging place for the larger part of the infective agent, and before complete subsidence has occurred the stratum of air near the floor contains a much larger proportion of the infection than does any other part of the air of the room. The breathing line of the young child, while on his feet, or on his hands and knees, is lower than that of older persons. When, therefore, there is danger of respiratory infection, the child receives a proportionally larger dose of it than does his elders. An added danger threatens the creeping child on account of its inclination to thrust everything into its mouth. His chubby little hand, moistened with his own saliva, sweeps the bacilli from the floor and returns to his mouth. The pathologic result is the frequent occurrence in these tubercular homes of the protean forms of tuberculosis—tuberculosis of the lungs, of the intestinal tract, and the mesenteric glands, of the cerebral membranes, of the bones, "scrofula," &c. As the recognition of many cases of tuberculosis among children is not easy, the actual number of deaths from tubercular infection exceeds considerably the number shown by any registration system.

In the State of Maine during the seven years 1892-98, there were 442 deaths from "cerebral" tuberculosis. Of those deaths 283 were of children under five years of age. There were also 1869 deaths from "inflammation" of the brain or "its membranes," 1113 of which were of children under five years of age. Many of these 1113 deaths undoubtedly were due to tubercular meningitis.

There were also registered in the same seven years 2522 deaths from "ill-defined diseases of infancy," 406 from atrophy and inanition, 655 from "debility and exhaustion," 292 from "anæmia," and 3761 from the "diarrhœal diseases of infancy." A correct diagnosis would have placed many of these under the various forms of tuberculosis as the cause of death.

Dr. W. H. Chapin,[19] of Springfield, Massachusetts, has made a careful and extended study of tuberculosis in that city. The following are a few of his family histories, which show the frequency of obscure brain affections in tubercular houses.

For instance, in the L. family there was in January, 1871, a death from consumption, and no more until 1879, when there was a child six months old died from marasmus; but two years later, in 1881, a person died of consumption again. The same year, two months later, another child died of marasmus. In 1884 there was a case of convulsions.

Another family history began in 1875. They had deaths in 1875, 1878, 1879, and 1881. The first was from hydrocephalus, the next from convulsions. The third was an uncle of the preceding two, and he died from consumption. The fourth was an aunt, and she died from consumption. The fifth was a child, and died from meningitis about four months later than the last case of consumption. They inherited their tuberculosis from the aunt who lived in the family! The mother and father are still living, and are not tuberculous.

Another family, in 1878, 1879, 1880, and 1883, had deaths as follows: The first from consumption, the second from tubercular meningitis, the third from consumption, and the fourth from convulsions.

Another family in 1871 had a death from consumption. That was the grandfather. In 1876 there was a case of death from convulsions, a child only one year old died five years later than the grandfather did. It may have inherited convulsions from the grandfather, but just two months later the father died from consumption.

Another family began in 1870. In March, 1870, there was a child three years old who died of meningitis, in 1871 another one, two months old, died of cerebral congestion, and in July, 1873, one died of cerebro-spinal meningitis. While those cases were going on, the father was actually tubercular; but he afterwards recovered.

Here is a family which lost four members in one year and six months. On the 18th of February, 1884, one died, three years of age, of cerebral effusion. On August 7th, the same year, one died of meningitis at the age of eleven years. On September 1st, 1885, one died, aged thirty-seven, from consumption. She was the mother; and on November 1st, 1885, the same year, two months later, a child three years and four months old died of meningitis. In that instance the case of consumption occupied the middle position, and cases of brain disease the others. Tuberculosis was not diagnosticated, although the woman must have been tubercular all the time. I have seen members of the family since; and they assured me the mother had tuberculosis, lasting about four years.

Here is a case, August 13th, 1882, where a child two years of age died of convulsions. May 1st, 1885, an infant two months old died of exhaustion. September 28th, 1885, a child four years old died of convulsions. April 30th, 1886, a child two years and two months old died of marasmus. No more about the family except last year I was called in to see the people, and found that they had three surviving children, all in good health—the father and mother in perfect health. I was asked to examine the mother's lungs, and I found signs of healed tubercular cavities. While these children were dying of various convulsive disorders, she was then coughing and spitting about the house. It seemed to me then that our statistics of tuberculosis should include almost all cases of brain disorder in children; that,

[1] Reproduced, by special permission of the author, from the eleventh report of the Maine State Board of Health, U.S.A.

[19] "Transactions" Mass. Assoc. of Boards of Health, iv., 3. 1894.

when as physicians we meet a case of brain disorder in a child, we should think of tuberculosis. And in the two histories that I have read the physical record shows us that, unless there is a person in the family who is actually tubercular (I mean by that, excreating tubercular pus), the children do not inherit it from their parents; and, if there is that condition of things, then children do inherit it.

During childhood, says Cornet, infection from inhalation shows itself as a primary tubercular development in the bronchial glands, while in later years it gives rise to primary tubercular deposits in the lungs themselves. The same author produces evidence that even among children, tuberculosis is much more frequently caused by inhalation of the infection than otherwise.

(*To be continued.*)

THE STAINES RESERVOIRS.*

By M. Mawson, A.M.I.C.E.

(*Continued from page* 112.)

The next work of importance is the pumping station, where the water which is to be put into store leaves the conduit, in order to be lifted into the reservoirs. The engine-house proper is 108ft. long by 55ft. wide, and will contain five triple-expansion Worthington pumping engines, each capable of lifting 16¼ million gallons daily to a height of 42ft. 6in., one of the five being held in reserve. The water is taken to the suction well of each engine through a concrete tunnel controlled by a penstock. The engines are surface condensing, the condensers forming part of the delivery from the main pumps. Each engine has its own air and feed pumps. The diameter of the cylinders are 11in., 18in. and 29in., and of the pumps, 35in.; the stroke being 30in. A 7in. centrifugal pump is fitted for draining any suction well if required, or for emptying the delivery mains of such water as cannot flow back into the conduit by gravitation.

An electric travelling crane capable of lifting ten tons is fitted so as to command the whole of the machinery, and the door at one end is so arranged that a railway wagon can be brought in from the siding to receive the load. Steam at 150 lb. pressure will be supplied by three pairs of Babcock and Willcox boilers, in a house 57ft. 6in. by 48ft. adjoining the engine-house, and furnished with convenient doors for unloading coal direct from the siding on to the firing floor. Each boiler contains 1265ft. of heating surface, and is fitted with a Babcox and Willcox superheater. Forced draught is provided by means of a steam-driven fan in an adjoining house, which contains also duplicate feed pumps and tanks, and an economiser of 240 pipes, with the usual arrangement of bye-pass flue.

At a short distance from the engine and boiler-houses, stands a smaller block of buildings comprising a workshop, with forge and the usual machine tools, and a house for the electrical machinery for lighting and power purposes. The elevations of these buildings are finished in gault bricks, with dark red terra-cotta dressings and light red brick arches. The chimney is round, 100ft. high and 5ft. in diameter, with a cast iron cap.

The delivery mains from the pumps are 4ft. in diameter, diminishing to 24in. at the valves and increasing to 4ft. 6in., and are of steel, each pair afterwards combining into a steel main 6ft. 4in. in diameter. There are two of these 6ft. 4in. mains, the engine in the centre of the row of five having a connection to both. The mains are of ⅜in. steel plate, with ½in. butt straps, and are laid side by side, being afterwards surrounded with concrete. Manholes are furnished at intervals of 100 yards for access to the interior.

Before entering the reservoirs the two 6ft. 4in. mains unite into one, 7ft. 10½in. diameter, afterwards again dividing into two branches of this size, in order that the whole of the water pumped may be passed into either or both of the reservoirs. The valves on all these mains are of considerably smaller diameter than the mains themselves, the latter being coned on either side of the valve on the "Venturi" principle. Thus the valves on the 4ft. pipes are 24in. diameter, and on the 6ft. 4in. and 7ft. 10½in. pipes 36in. diameter. The increase of friction due to this arrangement is hardly appreciable, while the saving in the first cost of valves is very considerable. The valves on the 7ft. 10½in. mains, and on the outlet mains from the reservoirs are contained in a well about half a mile from the pumping stations. The working floor will be at ground level, and will be enclosed by a brick building of the same general appearance as the smaller buildings at the pumping station.

The girders carrying the valve capstans will be covered by removable chequered floor plates, and a hand power traveller running along the whole length of the house will afford a convenient means of handling any portions of the valves which may require repairs.

Leading from the lower part of the well are two dry tunnels, approximately circular in section in the upper part, which are driven in the clay underlying the site of the reservoirs, until they reach the valve towers, with which they are united. These tunnels are built in concrete lined with brindled brick, the number of rings varying according to the position as regards the bank of the reservoir above, and the consequent pressure to be sustained. The tunnels are so graded that the drainage or the water from the scour valves on the mains will flow to a sump, over which is a well containing a centrifugal pump driven by an electric motor worked from the plant at the pumping station.

The valve towers, one in each reservoir, are circular concrete wells, 17ft. in diameter inside, rising from the tunnel end through the clay, gravel, and water in turn, till they reach the level of the top of the banks, or 5ft. above top water-line. The interior of the valve towers will be cut off from the tunnels by a stop or plug of brindled brickwork, surrounding the 7ft. 10½in. steel inlet main which is always open to the interior of the tower, and a 4ft. cast iron outlet main, which is carried up inside the tower to a point above top water level, and provided with valves for drawing off at different levels. The interior of the tower, and consequently of the pumping or inlet main, can be shut off from the reservoir by means of a large penstock of steel plates and girders, about 8ft. 6in. square lowered by gearing from the floor above, and closing an opening at the base of the tower, level with the bottom of the reservoir. The working floor of the tower will be covered by an ornamental brick building, and connected with the bank by a light lattice girder bridge.

The reservoirs themselves are two in number, separated by a cross bank. The top water area of the upper, or No. 1, is 178 acres, and its contents 1584 million gallons. The top water area of the lower, or No. 1a, is 246 acres, and its contents 1754 million gallons, giving a total area of 424 acres and a total capacity of 3338 million gallons.

The depth to which the puddle trench was sunk before reaching the clay into which it is keyed varied from 32ft. 6in. to 11ft. 3in. The thickness of puddle at the top is 6ft., and the sides follow a batter of 1 in 60 down to the ground level, thereafter narrowing to 4ft. at the junction with the clay bottom into which the puddle enters to a depth of 4ft. The whole of the clay used for puddle was excavated from the bottom of the reservoir, and ground in pug mills before use.

The banks are formed from selected ballast excavated

[20] "Die Verbreitung der Lungentuberkulose durch Contagion," page 17. 1884—Königsberg.

* Paper read before the Civil and Mechanical Engineers' Society, on Thursday, February 7th, 1901.

from the bottom of the reservoirs, the average depth required to form the banks being about 5ft. all over the area. The filling is carefully deposited in thin layers, well watered when required and rolled. The contractors' railroads are not allowed to cross over the puddle wall except where absolutely necessary, and then only on timber bearers, in order to avoid placing undue weight on particular points, and to do away with the possibility of unequal settlement. The banks when complete have a slope of 2 to 1 on the land side, and 3 to 1 on the water side, the centre bank being of course 3 to 1 on both sides. From the top down to a point equivalent to half the depth of water the inner faces of the banks are covered with slabs of concrete, 5in. thick laid *in situ* in sections 4ft. square, each alternate section being laid in the first instance, and the remainder filled in afterwards. A concrete wall or toe piece at the bottom edge prevents any tendency on the part of the slabs to slide down the slope. A flat benching 3ft. wide is formed outside the toe, and the remainder of the bank is faced with selected gravel, 9in. in thickness.

The top of the bank is 14ft. wide, and forms a roadway, and the outside slope on the land side is soiled and sown with grass seed in the usual manner, flights of steps being fixed at intervals for convenience of access. At three points on the bank a cart road is laid out on the face of the outer slope rising to the top of the bank at a gradient of 1 in 10, while the road on the top of the centre bank takes the place of a public footpath which formerly crossed the site.

The water from the reservoir, having been drawn off at the desired level, through the valves in the tower, passes down the 48in. cast iron outlet main already mentioned, through the valve well, and issues from a bell-mouth into a circular concrete basin forming the head of a conduit of smaller sectional area than that from the intake to the pumping station, with an invert 8ft. 3in. wide, and with a versed sine of 9in., the height and thickness of the walls remaining as before. This smaller conduit, which is capable of carrying 90 million gallons daily, returns to a point near the pumping station and close to the Billet Bridge under the London-road. Here it joins the conduit from the intake, which continues in the smaller section to Hampton, a distance of about six miles, passing under several public roads *en route*, either by bridges of the ordinary type or by syphons of concrete and brick. Of the latter a typical instance is the syphon at Shortwood Common under the London and South-Western Railway. The dimensions of the concrete tube are 8ft. 7¼in. wide at the springing of the roof arch, 6ft. 9½in. wide at the invert, the latter having a versed sine of 5¼in., and the roof having a rise of 2ft. 3in., the total height being 7ft. 8¼in. The arched roof is entirely of brickwork in three rings.

At the pumping station, on the down-stream side of the inlet to the pump wells, is a Stoney's patent sluice, 11ft. wide, by means of which the relative quantities of water passing to the pumps or flowing directly down the conduit may be regulated to a nicety.

The measurement and recording of the water pumped into the reservoirs and of that passing out will be effected by means of "Venturi" meters placed in the 7ft. 10½in. steel pipes at the point where the 36in. valves occur in the valve well, and in the 48in. cast iron mains in a special chamber built under ground to receive them.

The total quantity of water flowing down the conduit will be measured, in the case of the large conduit at the river Colne syphon, and in the small conduit at Shortwood Common syphon, by means of the relative opening of a balanced flap or door of sheet brass, built up on a light skeleton frame of cast iron. When no water is passing the door entirely closes the tunnel, and its movement is transmitted by gearing to the recording apparatus in a house above.

All these indications, as well as those of three distributing gauges at Hampton, and of water-level recorders at the intake and reservoirs, will be electrically transmitted to the pumping station, so that the state of affairs at any of these places can be ascertained by the superintendent without loss of time.

Along the route there are many watercourses of various sizes, but all of them at such a level that they have to be taken under the conduit in syphons. In most cases these syphons consist of a circular concrete wall at either side, connected by a concrete tunnel or a cast iron pipe, according to the amount of water to be passed. The wells are in all cases placed sufficiently far apart laterally to allow of future conduits being constructed alongside the first, without again disturbing the stream syphon.

At the greater number of stream crossings a 24in. cast iron scour pipe is provided, controlled by a valve, in order that the conduit may be flushed at intervals, and at as nearly as possible every mile an overflow weir is constructed in the side wall, provided with a swing shutter to prevent flood water in the stream flowing back into the conduit. At the bridge under the road from Sunbury to Hanworth, the East London Company's 36in. main to Finsbury Park was raised and taken over the conduit as a 36in. steel pipe, without any outside support. A few yards beyond this bridge, immediately to the north of Kempton Park, the New River Company will take their proportion of the water from the conduit into the works which they are now constructing, and from whence it will be pumped to the north of London.

After passing the Thames valley branch of the London and South-Western Railway, under a plate girder bridge, the distributing or balancing reservoir is reached, and the open conduit comes to an end. This reservoir is of comparatively small size, holding about 13 million gallons, with a depth of water of 7ft. At the western corner is an overflow weir 30ft. long, with a series of concrete steps leading to the Portlane Brook, the bed of which has been widened and prepared for the extra quantity of water which may at times pass down it. A 36in. scour pipe from the eastern end of the reservoir is taken into the same stream. From this reservoir will be taken the water apportioned to the Grand Junction and West Middlesex Companies. This water, as also that passed to the New River Company, will be regulated by a floating circular weir adjusted to allow no more than a certain depth to fall over into the interior of a telescopic pipe, and so to an open chamber separated from the water in the reservoir. In the event of the company concerned not taking all or any of the water, an automatic float recorder will show when the water in the rear chamber rose, and the gauge became drowned or ceased altogether to act.

The water will be carried to the existing works of the companies in 48in. mains of cast iron, the socket of each pipe having a steel hoop 1½in. by ½in. shrunk on.

The entire works, including a strip of land varying from 70ft. to 100ft. in width along the conduit, are enclosed by wrought iron unclimbable fencing, the total length required being nearly twenty miles. It may be of interest to note that the area of the reservoirs is about three-quarters of that of the city of London.

The author, in conclusion, desires to thank the joint engineers for their kind permission to use the material from which the foregoing figures have been compiled.

The death-roll from small-pox in Glasgow reached 120 on Monday; 387 patients were in the hospital.

A Local Government Board inquiry has been held at North Shields by Mr. H. Percy Boulnois, M. Inst. C.E., concerning an application by the Tynemouth Town Council for sanction to borrow sums amounting to £4539 for street improvement purposes.

THE SANITARY INSTITUTE.

THE STATE OF LONDON STREETS.

A SESSIONAL meeting of the members of the Sanitary Institute was held on Wednesday, 13th inst., at the Parkes Museum, Margaret-street, W. Sir Alexander Binnie, engineer to the London County Council, presided, and there was a large and representative attendance of London bodies of engineers and surveyors.

Mr. T. Blashill, F.R.I.B.A., late superintending architect to the London County Council, read a paper on the "State of the London Streets." He observed that the new metropolitan municipalities were recognising their enlarged powers and their heavier responsibilities, and he expressed the hope that the state of the London streets would early claim their attention. He asked them to agree with him that the streets are dirty and ought to be cleansed, because he could see the dirt and knew that the means of cleansing were at hand. He would not say that the streets of London were the dirtiest of any to be found in the cities of Europe, but amongst the great continental towns, whether capitals or not, there is nothing similar to them. In all such towns the streets, however they may be paved, are kept clean, chiefly by manual labour and the use of water, which in the summer at least is employed not only for washing away the slush or to keep down the dust, but for the pleasure and comfort of the people in the streets. Street dirt consisted of the wear and tear of macadamised roads, less from granite and wood pavements, least from asphalt. Then there was the sand used to prevent slipperiness. All these materials were comparatively of small account when contrasted with the great bulk of the horse droppings, worked up by wheels into slush in wet weather and ground into dust in dry. It trading streets there was a serious addition of animal and vegetable refuse, which would not exist if the law were properly enforced and special arrangements made for its collection. The Local Authority should pay more attention to the nuisance arising from dogs. Clothes were fouled by the street dirt, which was carried into houses in several ways. The effect of street dust on food in the houses would be an interesting inquiry. It was the poor who suffered most from dirty streets, which for thousands of children were their only playground. If the streets were clean the influence on the habits of a considerable proportion of the population would be great. Mr. Blashill then gave his experiences of street cleaning in Paris, Vienna, Berlin, Prague, Brussels, Buda Pesth, and Dutch towns, the position in these places being superior to that of London. He believed that street receptacles of one kind or another was the only satisfactory principle for coping with the dirt of the streets. Droppings should be collected fresh, and would then form valuable manure, and the manufacture of much dust would be prevented. The work of a scavenger should no longer be regarded as of a low class, or even unskilled; it should be well paid, and made attractive to respectable able-bodied men. The horse-broom should be used with discretion, and kept in good order; these brooms might do the heaviest work, but they had not the finish of hand labour. In concluding, Mr. Blashill said that it was his unhesitating opinion that the dirt in our streets has increased, is increasing, and ought to be diminished; and pointed out that, while large sums of public money were spent on education, comparatively small sums were spent on cleansing, watering, and lighting. His remarks were, of course, not intended to be anything more than an opening of the interesting discussion which he trusted they would have that evening.

Major ISAACS (Holborn), as one who had charge of an important London district for forty-five years, opined that the great factor which had produced the excellent results in Paris and other continental cities mentioned by Mr. Blashill was water. This was the element they wanted, but it was an expensive item in London administration. Then, too, if they used water in London as they did on the Continent, they would be subject to heavy penalties from the County Council for injuring the sewers. His contention was the metropolitan sewers were the proper receptacles for one-half the refuse of London, and given water and the use of the sewers, the problem would be solved.

Mr. EMERY (Marylebone Vestry) contended that the Local Authorities could not keep the streets clean until the filthy habits of the people had been reformed. He thought the police ought to be more strict in prosecuting persons who threw refuse from their houses into the streets.

Mr. W. NISBET BLAIR (St. Pancras) pointed out that the conditions of London and of continental cities were entirely different from each other. Not only were the climate and traffic different, but the police were much stricter, and householders were punished for throwing refuse about, and fined if their footway was not properly cleaned at certain intervals. Londoners would not submit to the strict continental regulations. Considering the small sums spent on street cleansing in London, he thought the Authorities were entitled to some credit for doing it as well as they did. With regard to increasing the amount of water used, they should not forget that all the water flowing into the sewers had to be pumped up again by the County Council.

Mr. WADDINGTON (Marylebone) spoke of the difficulties—the practical difficulties—of dealing with snowfalls. He explained how absurd were the newspaper criticisms on this subject, for it was financially impossible to keep an organised body of men ready for the work at a moment's notice. He had sixty miles of streets under his control, and to deal with this as the critics desired meant some 1400 or 1500 additional hands would be wanted. On the last occasion he could only get 300, and these were the dregs of the casual labour available for this work, because his Authority only paid 5d. per hour for such work, while the neighbouring Authorities paid 6d. per hour. If he had allowed him in Marylebone another ½d. in the £ per annum he could make a vast improvement in the general condition of the streets.

Mr. W. WEAVER (Kensington) said he thought the bad condition of London streets was much exaggerated. During the last forty years the state of things had immensely improved. Then peoplo would have mud up to their ankles every wet day and think nothing of it; now if a little mud was left anywhere complaints would be sent in by the score. Of course they must keep up to the modern standard as far as possible, but he thought the grumbling had come in with untanned leather boots and patent leather shoes. Horse droppings were the greatest nuisance; he got four tons a day per mile off the Kensington-road. He was now devising a street orderly to go under the kerbstones. He had once been complimented in a cycling journal as being the only surveyor in London who knew how to sand a road, and this was attributed to his being a cyclist. Now this showed how accurate newspapers were, for he used the cheapest sand he could get—it was dug up in his own parish—and he had never been across a bicycle in his life. He referred to the difficulty of organising scavenging labour, and said that a great part of the evils of which complaint was made was the constant opening of streets by public or private companies. For instance, in 1900 in 86 miles of road in Kensington 3928 trenches were opened; in addition trenches for electric lighting mains were opened to the extent of 7½ miles, and the telephone company to the extent of nine miles, or in all 16½ miles,

about one-fifth of the entire mileage; the cost of surface reinstating was £4625. The Post-office was now going all over it again in about nine miles of road with their telephone system. The nuisance and dirt arising from this source was incalculable.

Mr. W. Hunting, Mr. Gladwell, Dr. Smith, and others having spoken,

The Chairman pointed out that London laboured under a physical disadvantage as compared with many cities. London was built on a clay subsoil, and the least breaking of the surface caused masses of clayey mud. The sewers were not constructed to receive the street sweepings; in the first place, they were not large enough, and all the water that went into them had to be pumped up again at great cost. Any addition to their work in this respect meant a large outlay. Apart from that, water-borne sewage was valueless, and they ought not to sweep valuable manure into the sewers. As an illustration of the result of street washing, in Regent-street the deposit in the sewers since the watering had been adopted had risen from 9in. to 18in., and then to 2ft. 6in.; all this had to be removed by labour, because the fall was not sufficient to carry it off. Subways were regarded as the cure for the drawback of street opening, but only in new streets was this practicable, because the public companies having laid their pipes would not be forced by Parliament to do all their work over again, and the cost to the ratepayers of constructing these subways would be enormous.

A hearty vote of thanks to Mr. T. Blashill for his paper, and to Sir Alexander Binnie for presiding, closed an interesting and useful discussion.

Sanitary Inspectors' Associations.

NATIONAL UNION.

At a meeting of the North-Western Centre of the National Union of Sanitary Inspectors held at Ashton Hall, Liverpool, on Saturday, February 9th, Mr. Jas. Mort, chairman of the Centre, presided, and there was a good number present, including Dr. Daley, Bootle; W. Bland, chairman of the Union; J. T. Quinton, hon. district secretary; also Messrs. W. Stansfield, N. Coates, A. Gleave, A. J. Wilde, W. Urquhart, members of Council. Representatives were present from Liverpool, Manchester, Crewe, St. Helens, Lymm, Urmston, Birkdale, Formby, Bootle, Darwen, Litherland, &c.

When the business of the meeting had been disposed of, an important paper on "Tuberculous Meat and Milk" was read by Mr. J. S. Lloyd, M.R.C.V.S., Veterinary Inspector, Public Health Office, Town Hall, Manchester.

Mr. Lloyd introduced his paper by referring to the discovery of the tubercule bacillus by Koch, and the change of opinion regarding the nature of the disease which followed that discovery. Whereas it was formerly almost universally considered hereditary, now it has come to be known as a purely contagious disease, contracted by the absorption into the system of the bacillus tuberculosis derived from another individual affected with the disease.

After stating that the two chief methods of conveying the disease are by the inhalation and ingestion of tuberculous matter, the writer proceeds to point out the dangers incurred by the consumers of tuberculous meat and milk, as proved by numerous experiments in which different animals had acquired the disease as the result of being fed with food containing tuberculous matter, the latter in some instances being derived from a human origin and in others from animals. Although the disease had not been conveyed to man from animals by direct experiments, the writer quoted instances where such had been the case by accidental inoculation. The remarks and conclusions of the former Royal Commissions on Tuberculosis, contained in the report of 1895, concerning the danger to consumers of meat and milk derived from tuberculous animals, were next put forward, stress being laid upon the belief of the Royal Commissioners that persons consuming tuberculous matter incurred some risk of acquiring tuberculous disease, and that they regarded the disease in man and animals as practically identical, and transmissible from man to animals and from animals to man.

The writer next points out that tuberculous milk is considered much more dangerous than is the flesh of tuberculous cattle, and that the milk from cows having tuberculosis of the udder, in which tubercle bacilli could be found by microscopic examination, was excessively virulent, and without doubt a great source of danger to anyone who consumed it, as has been shown by numerous experimenters, Martin, Woodhead, Bang, Delepine, McFadyean, &c., who fed calves, guineapigs, pigs, and other animals upon it with almost certain infection in the test animals, and that the same thing occurs in human beings, particularly children, may be inferred from the prevalence of tuberculous disease of the alimentary tract, as shown abundantly by post-mortem examination and by the large percentage of deaths from tuberculous disease of the intestines among children. After bringing before his hearers the conclusions and recommendations of the last Royal Commission on Tuberculosis for controlling the danger arising from the consumption of tuberculous meat and milk, Mr. Lloyd points out that so far only very small steps have been taken by the Government towards carrying out their recommendations. Regarding the inspection of tuberculous carcases, the only thing the Government had done was to send out the instructions to meat inspectors, and in regard to milk from tuberculous udders, was to so amend the dairies, cowsheds, and milkshops orders, as to include in the word disease in Article 15, such disease of the udder as shall be certified by a veterinary surgeon to be tubercular, although certain powers had been given to several large towns under what are termed the "Milk Clauses." After explaining these, and how they are worked at Manchester, Mr. Lloyd drew attention to the great drawback that when cows having tuberculous udders are discovered, often after considerable expense and trouble, the clauses give no power to compel their slaughter, and so prevent such animals being sold from the farms where discovered to be used as dairy cows elsewhere.

After quoting figures from the agricultural returns regarding the prevalence of tuberculosis amongst bovines, and from the statistics of the Manchester Public Health Office (contained in the annual report of the Medical Officer of Health for 1899), regarding the percentage of tuberculous udders among dairy cows, the writer states that in his opinion steps should be taken to diminish these, both as a safeguard to the public health and in the interests of farmers and butchers. Whilst admitting that this meant considerable expenditure of public money, he states his opinion that to weed out the "wasters" and cows having tuberculous udders, with a fair compensation to butchers for the carcases of well fed beasts condemned in the public interests, would not cost so much as has been spent by the Government in its endeavours to stamp out swine fever, a disease which is not transmissible to human beings, and is little or no menace to public health.

Mr. Lloyd next gave details of a scheme for dealing with tuberculosis in cattle, which he had drawn up after considering somewhat similar proposals put forward by Delepine, Hunting, Laithwood, Wolstenholme, and others, and which, in part, includes the recommendations of the last Royal Commission on Tuberculosis. Put shortly, the scheme includes scheduling tuberculosis as a contagious disease, compulsory notification of "wasters" and cows having tuberculous udders, to be

followed by slaughter without compensation, powers to seize such animals in transit or in market, with penalties for being in possession or offering for sale, gratuitous testing of cattle, breeding only from cows and heifers which have passed the tuberculin test, erection and compulsory use of public slaughter-houses, uniform inspection of carcases by properly qualified meat inspectors.

A short account of the pasteurisation of milk and its adoption by Municipal Authorities and dairies completed the paper.

Discussion followed, in which the CHAIRMAN, Messrs. W. BLAND, W. STANSFIELD, H. HILTON, W. DALEY, and the SECRETARY took part. A vote of thanks was passed to Mr. Lloyd, who replied.

PUBLIC HEALTH IN IRELAND.

PROPOSED INSTITUTE OF PREVENTIVE MEDICINE.

AT the annual meeting of the Dublin branch of the British Medical Association, Sir George Duffey, M.D., the newly-elected president, in the course of his presidential address, referred to the proposal made by Sir Christopher Nixon to establish in Dublin an institute similar to that of the Jenner Institute of Preventive Medicine of London, which Lord Iveagh endowed with the splendid gift of a quarter of a million sterling It was to the study of bacteriolgy in relation to medicine, pathology, and to hygiene that they should look for more light in the treatment of disease and in their efforts for its prevention. In Dublin, and in Ireland generally, opportunities for such study were extremely restricted. They had not at present any properly-equipped recognised laboratories available for the application of bacteriology for public health purposes, to the diagnosis or to the prevention of communicable diseases. In Dublin, if a dispensary Medical Officer, or any other practitioner, desired in a doubtful or suspected case of infectious disease to have definite knowledge of the real nature of the case from a bacteriological examination, he should either put himself under an obligation to a member of the staff of some of the medical schools, or else pay a fee to a specialist, for an examination and report. In some of the large cities in England and in Scotland, particularly in London, Liverpool, and Edinburgh, the Municipal Authorities either support a bacteriological laboratory or subsidise one. In Germany, in France, and, I believe, in Italy, bacteriological laboratories are assisted by the Governments of these nations; and State bacteriological institutes have been recently established in various parts of Russia, including one at Merv, in Central Asia. In Belfast the Municpal Authorities have an arrangement with Dr. James Lorain Smith, the able lecturer on pathology in the Queen's College, to make bacteriological examinations in suspected cases of typhoid fever and of diphtheria, for each of which examinations he is paid a fee by the Corporation. It also grants an annual sum to the Council of the College for expenses—the examinations being conducted in the college laboratory. Special arrangements are made for larger investigations; and at present an important investigation is being made there on the value of bacteria beds for the treatment of sewage. Why should not some similar arrangement be made for Dublin? The results that have been shown to follow the investigation in such laboratories have been most valuable, and in many cases have undoubtedly prevented epidemics from spreading. The Irish Government has indeed to some extent recognised the importance of the information a competent bacteriologist can give by the appointment of Professor E. M'Weeney as bacteriologist to the Local Government Board for Ireland. But his official duties as such are limited in their scope, and he has to conduct his investigations in a small private laboratory, which he himself, I believe, would be the first to acknowledge is inadequate, both in size and in its equipment, for his work. It would seem most reasonable, therefore, that as neither the Corporation of Dublin, being the Sanitary Authority for the city, nor the Urban or Rural District County Councils of the County of Dublin, have as yet provided any means of giving any bacteriological assistance to their respective Medical Officers of Health in the diagnosis and prevention of infectious and epidemic diseases, that these bodies should, with the aid of Government, take action for the establishment and maintenance of a conjoint bacteriological laboratory, under the control of a highly qualified bacteriologist. In such a laboratory arrangements might also well be made for technical instruction in bacteriology for post-graduate classes, and for making original research. In the endeavour to arouse renewed attention to the importance of establishing such a laboratory in Dublin, I am entirely in accord with Sir Christopher Nixon's original proposal of forming one on the lines of the Jenner Institute of London.

National Health Society.

OFFICIAL TRANSACTIONS.

LADY SANITARY INSPECTORS.—We are very pleased to be able to record the success of two of our late students in the recent appointment of Lady Sanitary Inspectors in the Borough of Southwark. Both Miss Florence Nicolas and Miss Mona Richardson were trained for the examination of the Sanitary Inspectors' Examination Board by the National Health Society, and, in addition to the certificate of the Board, they hold the diploma of the National Health Society. It is most satisfactory to find that out of a large number of applicants for these two appointments the preference was given in both cases to ladies trained under the National Health Society. It is a further proof of the estimation in which the Society's training is regarded. Another of our students has been successful in obtaining an appointment as Sanitary Inspector in Bradford. Miss C. Florence Stephens attended the Society's training lectures at the same time as Miss Richardson and Miss Nicolas, and is also a diplomée of the National Health Society.

LECTURES TO THE MOTHERS' UNION.—One of the Society's lady lecturers has lately been giving some "talks" on Health to members of the Mothers' Union, at the Chapter House, St. Paul's. These lectures have been largely attended, and the audience has shown much appreciation of the instruction given.

LECTURES AT 53, BERNERS-STREET.—The fifth lecture of Dr. Cantlie's course on First Aid will be held at 53, Berners-street, on Monday, February 25th, at 3 p.m., when the subject of "First Aid for General Accidents, such as Foreign Bodies in the Eye, Ear, &c., Drowning, and Burning," will be dealt with. Sister Katherine will give the last lecture of her course on "Sick Nursing" on Thursday, February 28th, at 3.30 p.m.

ASSOCIATION OF NATIONAL HEALTH WORKERS.—The monthly "At Home" for members of the Association of National Health Workers will be held at 53, Berners-street, on Saturday next, February 23rd, at 3 p.m.

THE Burnham-on-Crouch Urban District Council and the Maldon Rural District Council propose to combine for the provision of an infectious diseases hospital.

MUNICIPAL ENGINEERING & SURVEYING.

CROSS-TABLE CHAT.

I HAVE been reading an admirable article on "The Bacterial Treatment of London Crude Sewage at Barking and Crossness," by Dr. Houston, F.R.S.E., which has been reprinted from the *Edinburgh Medical Journal*—wherein it appears this month—and published by Young J. Pentland, Edinburgh. Dr. Houston, it will be remembered, was appointed by the London County Council to investigate, from the bacteriological point of view, the experiments which have been in progress at Barking and Crossness on the bacterial treatment of sewage, and the reports which he has published in conjunction with Dr. Clowes, the chemist to the Council, form the highest and most valuable treatise on the biological qualities of effluents from bacterial beds extant, for prior to their publication there were practically no records on the subject.

I OBSERVE that Dr. Houston very properly and wisely observes that it must not be assumed that he is necessarily convinced that the bacterial process used during the course of the inquiry is the best one available, for it may be remembered I adverted in "Cross-table Chat" of the 17th January to the absence of originality and variety in the method of treatment of sewage in the experiments. To this extent it would appear that Dr. Houston dissociates himself from the responsibility as to the construction and working of the beds which was followed at Barking. But good as the results unquestionably are, he says he does not believe that they have reached the highest point possible in the bacterial treatment of sewage—a statement which, coming as it does from Dr. Houston, is very reassuring.

THE bacteriological experiments, it is to be noted, showed that the effluents, though excellent from a chemical and practical point of view, contain a large number of pathogenic microbes, and that, although fit to discharge into streams not used for domestic water supply, such effluents would not be safe in streams used for that purpose. It is, however, so rare that the outfall from sewage works discharges into a potable water supply that possibly this condition is not generally of prime importance, but it would be of especial interest to learn to what extent effluents from sewage treated on land, *i.e.*, by broad irrigation, vary in this respect from contact beds, and whether pathogenic microbes are removed by land treatment, for the objection seems to be more pedantic than practical.

I SEE that the objection may be met, if required, for Mr. R. F. Wood Smith, a bacteriologist and chemist, has patented an invention for sterilising and aërating effluents which have undergone bacterial treatment by the Dibdin's or Sutton process, or the Exeter septic tank process, by causing ozonised oxygen or ozonised air—that is air impregnated with ozone, as the case may be—in suitable proportions to be forced into the effluent, the requisites being an ozone-producing apparatus and a pump and a system of pipes by which the gas is conveyed into the effluent channel. The Royal Commission on Sewage Disposal, I am informed, are desirous of testing the system, and view it with some interest.

BUT I am not sure that this idea of sterilising effluents will not be prejudicial rather than beneficial, for it has been advocated all along by bacteriologists themselves that one of the valuable features of the bacterial system was the presence of the bacteria in effluents and that by their agency such effluents were further purified. The action of chemicals, it has been discovered, was to destroy or paralyse the micro-organisms and to retard decomposition of sewage, and this, it has been found, was an error. The bacterial system proceeded on directly opposite lines, and the micro-organisms were found to be beneficent creatures, which if properly harnessed would work out the purification of sewage by themselves. I greatly doubt whether this straining after the destruction of a few possibly pathogenic microbes by sterilisation will not result in the complete destruction of the non-pathogenic microbes, and harm, not good, will result. As I have already remarked there appears to be a lack of practicability in the suggestion generally.

THE Board of Trade have notified that the time has arrived when the maximum price of 8d. per unit, which has been allowed by them to be fixed in granting Provisional Orders, should be reduced to 6d. Since the date when the former maximum price was fixed the improvements in the manufacture and distribution of electricity have been so great, thereby lessening the cost of production—and undertakers, as a rule, charge much less than 8d.—that the Board propose, both with regard to all applications now before them and in future, to restrict the maximum price per unit to 6d.

IN carrying out new sewerage schemes in districts hitherto improperly sewered it is often a source of doubt with Local Authorities as to whether they are enabled to require the owners of private drains to connect their premises to the new sewers. Moreover, these old drains are generally constructed of improper materials, and are rarely water-tight, and as such should be entirely relaid. Some Local Authorities provide for the cost of connecting existing house drains to the sewers, and obtain a loan for the purpose. Others, on the contrary, succeed in getting the owners to do the work at their own cost by a judicious exercise of the provisions of Section 23 of the Act of 1875, which empowers a Local Authority, where a house is without a drain "sufficient for effectual drainage" to make such a drain as they may direct and connect to the sewer.

IN one instance which has come under my observation, where a Local Authority proceeded under this section and a ratepayer appealed to the Local Government Board against the Local Authority's interpretation of the words "sufficient for effectual drainage," the Board replied, "It appears to the Board that unless a drain is water-tight it cannot be considered sufficient for effectual drainage." Moreover, they added that as regards the question as to the material of which the drain should be constructed, this was one which they had no authority to decide, but they were advised that an engineer or architect of standing and reputation would not consider a drain "sufficient for effectual house drainage unless it were constructed of glazed earthenware pipes or of some other material; for instance, iron pipes equally strong and water-tight." I doubt not the information may be of some use to my readers.

SENEX.

THE REGISTRATION OF PLUMBERS.

FROM all parts of the United Kingdom questions have been asked us recently concerning registration that we think it desirable to again call our readers' attention to the fact that, at the recent Conference at Birmingham, it was decided to recognise as eligibe for registration in the grade of operative plumbers all operative plumbers who have already passed the requisite examination in workmanship, or who produce proof satisfactory to the Registration Committee of their district that they are earning the standard rate of wages in the district in which they may be working—provided such operative plumbers apply for registration not later than February 28th, 1901.

NOTICES.

ANNUAL SUBSCRIPTIONS.—The Annual Subscription to "THE SANITARY RECORD," for the United Kingdom, paid in advance, is 12s. 6d. For the Colonies and Abroad, 15s This includes postage, and a Copy of the Diary, post free.

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The Sanitary Record

AND

Journal of Sanitary and Municipal Engineering.

FEBRUARY 21, 1901.

THE KING'S SPEECH.

FROM the standpoint of the public health worker, the outstanding features of the Royal Address with which Parliament was opened last week were the promise of two important measures affecting the public health, and the omission of all reference to another most important subject in regard to which keen expectation had been aroused. The promises related to Bills for the amendment and consolidation of the Factory and Workshops Acts, and a Bill for the amendment of the Public Health Acts, particularly in regard to water supply. By the time this issue appears we shall have more information as to the scope and character of these projected measures, but at the time of writing they remain subjects for speculation. Curiosity will be especially keen with regard to the Bill of which Mr. Long has given notice, as though its main purpose is apparently to deal with questions of water supply, it is also to include "other matters" relating to the public health. What these may be, and in what manner it is proposed to deal with the subject of water supply, are questions in regard to which we cannot in the meantime hazard a forecast. The same remark may also be made in relation to the amending Bill of which Mr. Ritchie has given notice on the subject of the Factory Acts. But the purpose of Mr. Ritchie's second Bill is clear and free from ambiguity. It is to consolidate the complex system of the Factory and Workshops Acts. This much-needed measure has long been demanded, and it will be hailed with acclamation by all those engaged in the administration of the Factory Laws, for in the present maze one never knows where to turn, and cannot be sure of solid standing ground. It is to be noted, however, that these measures do not stand in the front rank of proposed legislation. They are embraced in the list of Bills which have been prepared, and, "if the time at disposal shall prove to be adequate," will be submitted. The promise of legislation in the directions indicated is, therefore, only provisional, but we trust that the early introduction of the Bills in which we are interested is an augury that they will be dealt with in earnest by the Government, and pressed to a successful issue.

The important omission to which we have referred is that of the housing question. No reference is made to the subject in the King's Speech, though the manner in which the subject has recently been alluded to by Lord Salisbury and other members of the Ministry undoubtedly awakened a belief in the country that it was to have some place in the legislative programme. This hope has been disappointed, to our great regret. The question will, however, be raised in the debate upon the Address, for Mr. Macnamara has already put down an amendment representing that the growing evil of the lack of proper housing accommodation for the working classes is one of the most pressing necessities of domestic policy demanding the attention of Parliament. The probability is that though the Government are firmly convinced of the gravity of the evil, they are not yet clear as to the course which legislation should take, or the nature of the remedies to be proposed. And for this attitude perhaps some apology may be found in the proceedings of such a Conference as the one at Manchester the other day, which was chiefly noteworthy for the variety of the suggestions put forward by the different speakers. It must be confessed that at none of the Housing Conferences that have been held within the last year has there been formulated a clear and distinct line of policy, backed by unanimous support, that could be made the basis of new legislation. Probably the point as to which greatest unanimity obtains is that which was urged upon Mr. Long last week by the

deputation from the National Housing Council—the extension of the period for which loans might be granted, say, to 100 years, at least in regard to land, whereby municipalities might be enabled to reduce rents, and materially contribute to the better housing of the poor. But even on this point Mr. Long has his doubts, though we fail to perceive the force of his objections. A perusal of his reply to the deputation leaves us in the greatest uncertainty as to what his attitude on the question actually is. There can be no doubt of his sympathies with the object aimed at, but his suggestions of remedies for the present intolerable state of matters have the attribute of vagueness. The same thing cannot, it is true, be said of Mr. A. J. Balfour's important letter, written on the eve of the assembling of Parliament, to Mr. F. H. Stead, in which he deals with the improvement of the means of locomotion as a factor in the solution of the problem. It is definite and concrete throughout, particularly in his exposition of his idea of a system of radiating thoroughfares for "confine-rapid" traffic, such as autocars. The picture that he draws is undoubtedly a most attractive one, but it is difficult to understand how he would propose to apply his idea practically to the existing conditions of city life, especially as existing in London, with its irregular labyrinth of streets. He claims that if improved locomotion is the real key of the housing difficulty, his scheme would provide the cheapest, the easiest, the most flexible, and the most convenient form of providing it, and its advantages he sketches with considerable detail. But he does not explain how his system of radiating causeways is to be laid down, without upsetting a whole city's arrangements, nor at what cost. We should welcome, however, a fuller exposition of the subject.

An Exemplary Sentence.

The action of Mr. Hopkins at the Lambeth Police-court last week should have a good effect upon those who think they can evict people without regard to their condition or the injury done to them. The action was brought at the instance of the Camberwell Borough Council against two men "for removing a quantity of bedding and furniture which had been exposed to infection without having afterwards been disinfected." A poor woman had the misfortune to have three of her children taken with scarlet fever, all of which were removed to the hospital. Unhappily, however, she had some dispute with the landlord over her occupancy of the rooms in which she lived, and the consequence was she was called upon to leave, and in the event of her not doing so a bailiff was instructed to take action. The Sanitary Inspector, however, was on the spot, and warned the bailiff of the danger he was running. But this individual "had instructions," and scarlet fever or no, he was sent to put the things out, and out they would go, and this, despite the promise of the Inspector that he would have them disinfected if left alone. But the bailiff thought he knew better than the Inspector or anyone else, and out the things went, with the result that ere evening came "children and adults were crowded round the infected bedding, which was placed at the side entrance of a tenement house." For this performance the magistrate inflicted a fine of £5, with an additional five guineas for expenses. With such a punishment we do not think he will repeat the offence.

A Wiltshire Village.

Dr. J. Tubb Thomas, the County Medical Officer for Wiltshire, is trying to do something to improve the sanitary conditions of the villages of his county, and if there are many like that of Ludgershall, the need for such work is indeed great. Last December this officer paid a visit to the village named, and his report, which has just been published, reveals a most deplorable state of affairs. For years the population of the place has been decreasing, but recently the army authorities have purchased land in the adjacent district, and people have been attracted to the district. The consequence is that rents (which before were fairly low) have been raised, but nothing has been done to make the houses habitable. What they are like may be gathered from the description given by the Medical Officer. He says:—"The majority of the cottages are thatched, hardly any have any rainwater spouting, and none any drains, the walls are damp, floors and ceilings and stairs very dilapidated and in many instances dangerous. Slops are supposed to be thrown upon the gardens, but in the majority of instances they appear to be thrown into shallow holes near the back door with other household refuse. The privy accommodation of the village can only be classed as scandalous, hardly a cottage with a brick or stone built privy, the majority being rough tumbledown wooden shanties, some without three sides and a door, and all with a roughly dug hole for a cesspit, the greater number of these holes imperfectly covered, and the seats in bad repair, and all smelling most offensively. I cannot say that during the whole day that I saw a single privy in a sanitary state."

A Polluted Water Supply.

This is bad enough, but the sources of water supply indicate an even greater danger to the inhabitants. It is derived from deep wells in the chalk, but little care seems to be taken to safeguard its purity. A large number of houses on the Andover-road derive their supply from a public draw-well on the roadside. This well, says Dr. Thomas, "is imperfectly protected at the top, and each person brings her own bucket, with the result that dirty buckets are lowered into the well, with consequent serious risk of pollution. Whilst standing at the well with Dr. Lawrence we saw two very dirty buckets being used; from one I scraped off the dirt with my finger to show the user how dirty the bucket was. This well should be more perfectly protected at the top and a pump fixed, and until this is done a bucket should be attached to the

rope, and all persons using the well thus obliged to pour the water from this bucket into their own vessels, instead of lowering their dirty buckets into the well. Some of the private wells in the village are equally liable to pollution. At one baker's I found a filthy pig-stye practically on top of the well. At another baker's there was a very large heap of night-soil, within 25ft. of the top of the well, besides several cesspits. At another there was a large manure heap containing several tons of manure within 25ft. of the well. All these wells are dried steined, and there is nothing to prevent surface water percolating into them, the subsoil being chalk and full of fissures." The advent of the military to the district has caused a large hotel to be erected at a cost of over £9000, with at least nine water-closets. Practically the whole of the site will be covered with buildings, and it is proposed to obtain the water supply from wells sunk upon the site, which is riddled with old dumb-well cesspools. The doctor was informed that two wells at present upon the site are polluted and unfit for use, and yet it is expected to obtain a pure supply from the limited site. The whole of the sewage of this large hotel, with its nine water-closets, is to be led into a cesspool upon the site; this cesspool will be within 3ft. 6in. of the walls of the house (the commercial room end), and it may be said that the sides of this cesspool will adjoin the foundations of the house. There are no sewers in the village, so there are no other means of dealing with the sewage other than with a cesspool, but it is extremely undesirable that the sewage of such a large hotel should be dealt with upon so contracted a site. Dr. Thomas concludes his report with several recommendations, which the local District Council has been invited to see carried out. It is to be hoped that body will do this. But the question is—May this village be taken as a sample of those surrounding the new great military encampment which is being formed in the district? If it does, no time must be lost in working a change, or else outbreaks of enteric will not be confined to the war-devastated veldt of South Africa.

The Cry for Better Houses.

No matter which way we turn, or in what paper we look, on every hand there are indications of the impression that the most important social problem of the day is that of "Housing." Liverpool men speak of it on every conceivable occasion. One Councillor opened a bazaar the other day and took occasion to bring forward a proposition to create a conglomerate Committee from the Watch, Health, Insanitary Properate, Parks and Gardens, and Water Committees of the City Council. The members of such a body, he thought, might, by the aid of experience gained on their respective Committees, formulate some practical solution of the difficulty. Middlesbro' and the Hartlepools, on the east coast, are also anxious to better the condition of their workers, and, in fact, there is hardly a municipal body in the country but what has been stirred up in the matter. On Saturday last Bristol had a special conference, at which over 200 delegates were present from all parts of the country. The conclusions arrived at urged that it was necessary (1) to extend the period for repayment of building loans under Part 3 of the Act of 1890 to the full statutory period of sixty years, instead of restricting it, as at present, to thirty or forty years; (2) to relax the Model Bye-law of the Local Government Board which prohibits the building of an attic third floor on the 9in. wall of a cottage; (3) and in favour of power being given to municipalities to obtain land at a price based on its assessable value. It was pointed out that these first two simple things could be done by a stroke of the pen, and would enable a third bedroom, so often needed, to be added to a cottage at a very small cost, thus reducing the proportionate rent of cottages by at least a shilling per week.

THE INSTITUTE OF SANITARY ENGINEERS

(Incorporated).

OFFICIAL TRANSACTIONS.

NEW YEAR'S PRESIDENTIAL ADDRESS.

By J. B. Wilkinson, D.P.H., &c., M.O.H. County Borough of Oldham, and Consulting M.O.H. County of Huntingdonshire.

(*Continued from page* 143.)

Perhaps in the pollution of water supplies one system is not more detrimental than the other, when both methods are managed with equal care and provided that the sewage or refuse is not disposed of near to any water source. That the water-carriage system has disadvantages cannot well be denied, although its advantages considerably overbalance any that may be raised. Many of the apparent disadvantages are really due to improper fixing or erection in the first instance. Leakage from the pipes through imperfect joints cannot be correctly enumerated as a fault of the water-carriage system. Nor can the contamination of the water cistern, in consequence of a direct connection with the closet, or the constant breaking of the seal, and the consequent introduction of sewer gas into the dwellings through the omission of a ventilating pipe to obviate this. These and many other undesirable incidents which constantly occur in connection with the water-carriage system are not due to the system itself. The risk of blockage of the pipe leading from the closet may, perhaps, in rare cases, be due to the system, though I think the instances where a blockage occurs without some contributory neglect on the part of the users is an exceedingly rare occurrence.

It is well known that when a closet is used by those who are naturally careless, or by those unaccustomed to the use of one, blockages frequently occur.

It is a general idea among these persons that a drain is a receptacle for everything which will go into it, and as a closet has a larger opening leading into the drain than the ordinary inlet, it is therefore a much more convenient place in which to empty ashes, rags, and rubbish of all kinds. It is generally nearer than the ashpit, and much easier to dispose of the latter in this way than by burning them. There are, however, certain disadvantages which are really incidental to the water-carriage system; one of these is the risk of freezing. While I am of opinion that this disadvantage has been considerably exaggerated, there is no doubt a risk of the pipes or cisterns freezing in outside closets, and especially in exposed districts. To a considerable extent this may be obviated by having the pipes properly packed, and

the doors and windows made to fit properly, but still it does occur in severe weather, and this is a time when skilled assistance is most difficult to obtain.

A little trouble on the part of the householder by hand flushing would tide over the likelihood of any serious inconvenience until the frozen pipes had been attended to, but I much doubt if the average householder will give this requisite attention. In those houses where the closets are built close up to the wall of the house the liability to freeze may be almost entirely prevented by the pipes and cistern being placed inside the house, care being taken that the closet does not ventilate into the house also. The blockage of a water-closet in the winter during a frost is the least harmful time also for excreta to be maintained in the proximity of a dwelling, as bacterial life is at this time in an almost inactive stage, and cannot be compared with the retention of excreta in the warmer weather, when the conditions which promote the extension of certain infective diseases are most prevalent.

A second objection against the general adoption of the use of water-closets, which in many places constitutes a real difficulty, if not negativing them altogether, is the increased water supply which is necessary, and the necessity of having a head of water or water at a higher level than the closet. In small communities the usual absence of any pumping force for the supply of the cisterns would be a very serious obstacle to the general adoption of the water-closet, as only few houses would be able to carry out the necessary hand pumping. The necessity for a greatly increased supply of water is, however, in many places the greatest difficulty. The rapidly increasing populations of our large towns, and the increasing use of more water by individuals as their knowledge of its use advances, render Municipal Authorities exceedingly chary of introducing measures which will increase the use of the already none too plentiful supply of water; and in recent years an entirely new form of closet is gradually gaining favour, being a sort of half-way house between the conservancy system and the best of all methods, the clean-water closet. These slop-water, or waste-water closets, as they are called, do away with the retention near dwellings of refuse, and save the cost of its removal, and at the same time do not require any increase in the quantity of water used, or, at least, only a very small additional quantity.

(To be continued.)

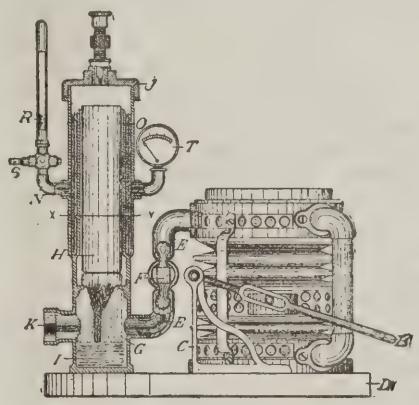
At a meeting of the Election Committee, held on the 13th inst., the following gentlemen were elected:—

Members: H. J. S. Abrams, London; W. N. Cosgrave, Straits Settlements; T. A. Croghan, Buxton; J. E. Scott, Newcastle-on-Tyne.

Associates: G. W. Bird, Ripley; A. E. W. Blissett, Clifton; W. T. Mansfield, London; J. J. Pratt, Hillingdon.

A NEW DRAIN TESTER.

Anything that is calculated to make the work of the Sanitary Inspector lighter, and at the same time more efficient, is worthy of more than passing notice. Drain-testing is one of the most important pieces of work these officers have to perform, hence the need for the best apparatus. There are several features in the drain tester just introduced by Mr. Richard Ravenor, of Newbury, Berks, which appear to be a distinct advance on many of the machines at present in use. Its compactness will be at once apparent from the subjoined illustration. It is designed for testing drains and soil-pipes by means of smoke and air pressure, and has for its object the arrangement and construction of an apparatus with which smoke rockets can be used effectively in drains of considerable length without danger of explosion of unconsumed gases emitted from the previous rocket. A further claim is that its ready adaptability is secured for testing with air and smoke separately or combined, at high or low-pressure as desired, viz., from ½ oz. to 10 lb., or more. Another valuable feature is its extreme portability, simplicity, and small size, which is gained without any sacrifice of capacity and usefulness. Time and expense are saved in testing long lengths of drains, as a number of rockets can be fired successively without disturbing the connection with the drain, and without fear of explosion. At the bottom of the smoke chamber G will be found a small receptacle I for containing water, which will catch and extinguish any sparks or incandescent material that may be emitted by the rocket during combustion. Fresh rockets may be inserted by simply removing the brass cap J at the top of the cylinder. To test with low-pressure, after stopping all ventilating



pipes, connect the hose to drain, work the bellows, and if the water in the annular channel O rises in the gauge R, close tap F, and if water remains in the gauge it proves the drain sound. If unsound, the user takes off the cap J, and inserts a smoke-rocket to discover the whereabouts of the leak. If high-pressure is desired, he simply turns off the tap S, and proceeds as before.

We understand that Mr. Ravenor has subjected his apparatus to several very severe tests, and that it has been able to fulfil all that has been required of it. Its compactability alone makes it worthy the attention of all who have use for such machines.

Public Works.

SEWERAGE.

Application is to be made for sanction to a loan of £2800 for the provision of two filter beds at the Longton sewage farm.

Tenders are to be invited by the Poole Town Council for machinery in connection with the sewage works in course of construction.

So successful have the two experimental beds of half an acre each proved that the Rivers Committee of the Manchester Corporation last week resolved to have ten others, of similar capacity, for treating the sewage of the city by the bacterial method.

The sewerage scheme for Senghenydd, Abertridwr, and Caerphilly has been constructed by Mr. T. Rossiter, builder, Caerphilly, at a cost of £13,000. The last pipe was laid last week. The work has been accomplished within twelve months, and the main extends from Senghenydd to Wainybarra Farm, a distance of about six miles.

THE revised estimate of Mr. Baldwin Latham, C.E., of the proposed sewerage works for Tarporley is £5170 instead of £4736. Application has been made for power to borrow £4500.

MESSRS. KAYE, PARRY, AND ROSS, Civil Engineers, of Dublin and Westminster, have been appointed Consulting Engineers for the Armagh Main Drainage Works, which are being carried out from the plans and specifications prepared by Mr. J. Finlay Peddie, C.E., of Belfast.

THE Local Government Board has written the Foleshill Guardians giving notice of an inquiry to be held respecting an application of the Coventry Corporation to borrow £32,962 for a sewerage scheme for the area added to the city. The Clerk, answering Mr. Gossage, said that Mr. Newey, the Surveyor, had seen the plan and he knew what sewers would be in Foleshill. It was only a short length, and the Council would be protected under the Public Health Act, so far as highways were concerned.

WHEN Chicago first proposed to construct a drainage canal by which the city sewage would be turned into the Illinois and Mississippi rivers, the chief opposition to the project was from those who thought the canal would lower the level of the great lakes, making the Mississippi a rival of the St. Lawrence as the outlet of the lake waters; but the people of Chicago went on with the construction of the canal, and spent 34,000,000 dols. upon it. When the canal was completed it did not have any appreciable effect upon the level of the lakes; but an outcry arose from the city of St. Louis that its water supply was being contaminated by Chicago. The United States Supreme Court has decided in favour of the city of St. Louis, and unless Chicago can prove that the flowing water is purified before it reaches St. Louis, the canal cannot be used for the purpose for which it was constructed.

THE Haywards Heath drainage inquiry ended on Tuesday in last week, the Haywards Heath Urban Council withdrawing its application for compulsory powers to acquire the site it proposed taking for sewage disposal at Lindfield. The agreement is that Mr. Sturdy, of Lindfield, will sell another site to the Council on agreed terms, and that neighbouring owners will contribute among themselves a sum of money to compensate Haywards Heath for the additional cost of having to go further afield with their sewage. A further agreement is to be made between Haywards Heath Urban Council and the Cuckfield Rural District Council to also take away the present sewage field at Lindfield, the Local Government Board to decide if there should be any difficulty as to terms between the two Authorities. The whole of the Haywards Heath and Lindfield sewage is to be taken eastward; but no mention has yet been made of the site.

THE new sewage works at Coventry, which were commenced in March, 1898, are now completed, with the exception of a few minor details, unimportant in themselves, and yet of moment to the general operation of the works. The scheme, which it will be seen has taken nearly three years to complete, has been carried out practically as designed, no extensions or additions having been made, and only a few slight modifications having taken place. The system of treating the sewage will be on the principle known as broad irrigation, and for this purpose the Corporation acquired nearly 500 acres of land in the Avon Valley, between Bagington and Ryton. This land has been laid out as a sewage farm; various pipes, carriers, and sewage distribution works have been constructed, so as to enable the sewage to be applied to any portion of the farm area. This is by far the most costly sewage scheme that has been adopted by the Coventry Corporation. The pumping station and plant will account for some £40,000; the cost of the works in connection with the rising mains and the laying out of the farm will amount to about £42,000; while, in addition to all this, there are certain works being carried out by the Corporation by administration, so that the total expenditure, wholly exclusive of the cost of the land, will probably be £100,000. The farm itself was purchased at a cost of £100 per acre; the scheme, therefore, when fully completed in every detail, will have entailed an expenditure of no less than £150,000. The City Council has decided that the whole of the sewage works shall be under the management of a separate Sewage Committee, which has been duly appointed.

IN answer to a communication from Captain Pasque, of the Royal Engineers' Office, Cardiff, the Clerk of the Porthcawl Council has been instructed to write that the Council is making application to the Local Government Board for the sanction to lease the land now used as irrigation ground by the War-office authorities for the purpose of erecting a rifle range, and also to borrow money to displace the sewage by a fall to the sea. A motion has been carried authorising the Clerk to draft such an application to the Local Government Board.

A LOCAL Government Board inquiry has been held at Doncaster by Mr. W. O. E. Meade-King, C.E., as to the compulsory purchase of land for sewerage and sewage disposal purposes for Askern, Bawtry, Bentley, Bentley-road, and Arksey. The schemes, which have been prepared by Messrs. D. Balfour and Son, of London and Newcastle-on-Tyne, comprise the main sewerage of the above places, all of which will gravitate to underground storage tanks, from which the sewage will be pumped to the site of disposal works there, to be treated in bacterial tanks, and afterwards on land. Various opponents to the scheme were represented by counsel, who objected chiefly on the ground of cost.

THE Doncaster Rural District Council and the Denaby Parish Council, having appealed against an order of the County Council of the West Riding of Yorkshire, granting urban powers for a portion of the parishes of Conisburgh, Denaby, and Cadeby, a Local Government Board inquiry was held by Mr. W. O. Meade-King, C.E. The appellants called numerous witnesses as to the present government of the parishes; and also Messrs. D. Balfour and Son, of London, as to the existing and proposed sewerage works; and Mr. Eaton, of London, as to the water supply. The defendants, the Parish Council, called no evidence, but had their case stated by counsel. The Inspector carefully viewed the district, and will report in due course to the Board.

A LOCAL Government Board inquiry was held at Waddesdon by Mr. F. H. Tulloch, M.I.C.E., last week; into a petition presented by the Aylesbury Rural District Council for power to put in force, with reference to certain lands required by them for purposes of sewage disposal for the township of Waddesdon, the Land Clauses Act, with respect to the purchase and taking of lands otherwise than by agreement. The land in question was about three acres of glebe adjoining the Quainton-road, of which the Rev. Dr. Yule, as rector, is the life owner. Mr. Guest Luckett, Engineer to the Council, was present, and explained the scheme to the Inspector. On the following day a similar inquiry was held at Haddenham by the same Inspector. Mr. G. Luckett on this occasion was also present as engineer of the scheme, and explained the plans. In both cases there was considerable opposition.

THE principal business at the meeting of the Burton-on-Trent Town Council last week was the consideration of the report of the Committee appointed to deal with the defective drainage of the sewage farm. The cost up to the present of putting the matter right had, it was stated, been about £1350. The Committee regretted that, owing to the lapse of time that had occurred, it was impossible to properly fix the blame for the systematic fraud that was evidently carried on by some of the gangs of men employed, with the cognisance of the foreman, who had been dismissed. A long discussion ensued, during which the Committee's report was severely criticised because of its paucity of detail, and eventually an amendment was accepted providing for the members to be supplied with a full and ample report of the negotiations which had taken place on the matter.

WATER.

THE Local Government Board has sanctioned the loan of £9026 for a water scheme for Bewdley.

AT the annual meeting of the Thirsk District Water Company, it was reported that the receipts for the year 1900 amounted to £1521, an increase of £154. The profits, after charging interest on the debentures, were £983. A dividend of 3 per cent. per annum is proposed, leaving £263 to be carried forward.

At the last monthly meeting of Wishaw Town Council it was reported that, granted favourable weather, the new waterworks (costing fully £100,000) would be so far finished that it would be possible to turn on the new water supply by the 1st of March.

Last week, at the West Gloucester Water Company's works at Frampton Cotterell, the formal opening of a new engine-house and pumping engine took place, in the presence of several directors, shareholders, and other gentlemen interested in the progress of the company.

The water supply for the district of Herrington, which has been very unsatisfactory of late, has been remedied, and active preparations are being made with the building of a large water reservoir on the top of West Herrington Hill for the purpose of containing the water which is being pumped from a spring at East Herrington, and which is to supply the entire colliery district named.

The Llanelly Borough Council has now decided to grant a water supply to Burry Port, the daily consumption not to exceed 300,000 gallons. The question of water supply for this place has been under consideration for a long time, several local schemes having been propounded. None of these were free from serious objections, however, and in the end it was decided to fall back upon a supply from Llanelly. The price charged will range between a minimum of 4d. and 6d. per 1000 gallons.

A water diviner has offered his services to the Sculcoates Rural District Council for the benefit of Preston. Last week, when the matter was discussed at the meeting, presided over by Mr. J. H. Fisher, it was suggested that the Local Government Board would not sanction any expenses of people with divining rods, however excellent the testimonials. Some members thought that pure water existed in the neighbourhood, but they doubted whether the quantity would be sufficient for the supply of the village, and the diviner's letter was left on the table.

The scheme of the Barrow Corporation for taking water from the river Duddon and Seathwaite Tarn, and for which a Bill is being promoted in Parliament, is meeting with considerable opposition. Millom District Council has decided to oppose the Bill, and the Hodbarrow Mining Company contemplate like action. Several farmers, who have sheep-dipping rights in the river, also propose to oppose unless the Barrow Corporation will guarantee them their present rights and privileges. The Corporation has come to terms with the Ulverston District Council, and is at present negotiating terms with the Dalton Urban District Council.

The question of supplying the villages of Dyffryn and Llwyngwril with a wholesome supply of water has engaged the attention of the District Council for a period of at least four years, and even now a start has not been made in either one case or the other. At Dyffryn two likely sources have been inspected, but not yet finally decided upon, the source near Llwyngwian being the favourite. At Llwyngwril matters are more advanced, although greater progress is desirable. An attempt is to be made to get this supply completed before the summer season, and, granting a favourable report from the inquiry to be shortly held, as well as the co-operation of landowners, this desirable state of things may be brought about.

At the Guildhall, Westminster, last week, before Mr. Perrin, M. Inst. C.E. (Official Water Examiner), Dr. Theodore Thomson, and Mr. E. A. S. Fawcett, a Local Government Board inquiry was opened with reference to a set of regulations for the prevention of the waste and misuse of water, which have been prepared by the eight metropolitan water companies and presented to the Local Government Board for approval. Mr. Cripps, K.C., made a lengthy statement on behalf of the water companies. He complained of misrepresentation with regard to their objects, and declared that it had been proved before Lord Llandaff's Commission that it was the imperative duty of the companies to prevent the awful waste of water which went on in the Metropolis, and which had caused in the past a serious inconvenience to those consumers who made use of the water in a proper manner. It had been shown to that Commission that there was a waste of five gallons of water per head as a rule, which in London amounted to 60,000,000 gallons a day. This had led to water famines, and it was a wastage which must be made good.

At the last quarterly meeting of Louth Town Council, the Highways Committee reported in favour of the purchase of the Louth Waterworks, and advised that a sum of £15,100 be offered for the undertaking. It was decided to discuss the question in committee of the whole Council.

The average daily supply of water delivered from the Thames to the Metropolis during the month of December last was 113,384,458 gallons; from the Lea, 44,204,673 gallons; from springs and wells, 40,471,192 gallons; from ponds at Hampstead and Highgate, 110,027 gallons. The last is used for non-domestic purposes only. The daily total was, therefore, 198,170,350 gallons for a population estimated at 6,165,490, representing a daily consumption per head of 32·14 gallons for all purposes.

At Ashill, Norfolk, a new supply of water has been required at Bury's Hall, as the old well, which was 145ft. deep, showed signs of impurity. In the hope of finding water nearer the surface, "Professor" Stone was consulted. Having cut a forked branch of willow as a divining rod, he perambulated the grounds. The rod suddenly turned and fell towards him, when he declared that good water would be found at a depth of 25ft. Well-sinkers commenced work at the spot, and at 24½ft. an abundant supply of water was found, which soon showed a depth of 13ft. In the old well, which is only a few yards off, there is scarcely any water.

Sir Allan Sarle had a story of continued progress to tell at the meeting of the shareholders of the Sutton District Water Company last week. The capital expenditure during the half year amounted to £5509 11s. 6d., bringing up the total to £131,615, but as the heavy extensions which had been in progress during the past two or three years are now approaching completion, it was not expected that there would be very much more expenditure on that account for some years to come. The profit and loss account showed that the water rentals had increased from £8462 to £8803, but on the other hand the working expenses showed an increase of from £3408 to £4325, or nearly £1000. However, the increased expenditure did not affect the dividends, which were declared, as for several half years past, at the rate of 10 per cent. per annum.

The Public Control Committee reported to the London County Council last week that in consequence of the parish of South Hornsey being added to the County of London by the London Government Act, 1899, it is necessary that steps should be taken for the extension of the constant water supply system therein. The Committee recommended that notice be served on the New River Company to give a constant supply of water on and after the 1st day of July, 1901, to a district situated within the metropolitan borough of Stoke Newington bounded by an imaginary line running from a point in the centre of Seven Sisters'-road by Blackstock-road along the centre of Seven Sisters'-road to Green-lanes, thence southward along the boundary of the metropolitan borough of Stoke Newington to Church-street, westward along the said borough boundary to Green-lanes, and thence in a north-westerly direction along the boundary of the metropolitan borough of Islington to the above-mentioned point in Seven Sisters'-road. The recommendation was approved.

In compliance with the Standing Orders of Parliament, estimates have been prepared by the engineer acting on behalf of the proposed Ilkeston and Heanor Water Board showing the cost of the works proposed to be undertaken by that Board. The works comprise the sinking of an intercepting well communicating with the Meerbrook Sough, from which well an aqueduct will be laid down to a pumping station, to be called the Meerbrook Sough Pumping Station. From this pumping station another aqueduct will be laid down to a covered service reservoir, to be called the Chadwick Nick Reservoir. Two other aqueducts will also be laid down, connecting with the proposed covered service reservoirs at Shipley and Codnor Park, to be known respectively as the Ilkeston Reservoir and the Codnor Reservoir. The aggregate cost of these works is estimated at £128,000, which includes the purchase of the necessary property, and provides for contingencies. The further sum of £6000 will, however, have to be provided by the Corporation of Ilkeston and the Urban District Council of Heanor to acquire the undertaking of the Meerbrook Sough Company.

LIGHTING.

THE majority of the Colwyn Bay and Colwyn ratepayers have voted in favour of the purchase of the gas concern.

THE Dartmouth Urban Council has borrowed £20,000 from the Prudential Assurance Company for electric light purposes.

THE London County Council has agreed to lend the Poplar Borough Council £27,360 for an electric light installation.

THE Chard Town Council has decided to invite schemes and suggestions with a view to the public lighting of the town by electricity.

DURING the quarter ended December 31st last the electric lighting works at Canterbury yielded the Corporation a profit of £268 3s. 4d.

A LOCAL Government Board inquiry was held by Mr. Ducat at Newbury, last week, touching the application of the gas authorities to borrow the sum of £2500.

THE Taunton Town Council has decided to apply to the Local Government Board for sanction to a loan of £17,780 for the extension of the electric lighting system and plant.

CONSUMERS will be glad to know that the London County Council has unanimously decided to oppose the Gas Light and Coke Company's Bill. This action should be supported by every Local Authority in London.

THE new gasholder at the Holbeach Gasworks has just been completed, and has now been put into use. It has been erected by Messrs. Dempster (a well-known firm of gasworks contractors), under the supervision of Mr. J. G. Hawkins, manager of the large works at Spalding.

THE South London Electric Supply Corporation is making another generous offer to the inhabitants of Lambeth by undertaking to wire their houses for an equivalent of six eight-candle power lamps and supply the fittings, together with a prepayment penny-in-the-slot meter, absolutely free of all cost. There should now be no impediment to the general use of electric light for illumination instead of gas.

AT the half-yearly meeting of the Bedford Gas Light Company the directors reported that the new Bill had received the Royal assent, and acting under its powers, £3000 additional capital had been issued. The total cost of obtaining this new Act of Parliament exceeded £900. On the proposition of the Chairman, the report and accounts were duly approved and passed, and it was recommended that the dividends be declared at the usual rates as fixed by the sliding scale.

THE high price of coal was responsible for the somewhat unsatisfactory report submitted to the shareholders and profit sharers of the South Metropolitan Gas Company last week. But for the increased price of gas, Mr. G. Livesey explained, the deficiency in revenue would have been greater than the whole half-year's dividend. By the automatic action of the sliding scale the dividend payable was reduced by £19,796 in the half-year, so that, with £11,000 lost on the profit-sharing system and the reduced dividend of 5 per cent., the total burden arising from the high price of coal was £40,000 for the half-year. The Board, it was stated, contemplated a reduction in the price of gas of not less than 2d. per 1000 cubic feet from June. The report was adopted.

A DEPUTATION from the Watching, Lighting, and Fires Committee of the Aberdeen Town Council was in London last week making inquiries regarding two new systems of street lighting. One of these is the Sugg patent water pressure gas, and the other the Kitson system of lighting by petroleum. Both these systems are in use in London. Both methods are considered by some lighting experts to be superior to the electric light, in addition to being considerably cheaper. The deputation was most favourably impressed with the new illuminants, and it is possible that the manufacturers will be invited to fit up one or two lamps in Aberdeen as an experiment. During their stay in the Metropolis the deputation visited a number of works where mantles for incandescent gas lighting are manufactured. A visit was also paid to the central fire brigade station. On their journey north they stopped at Manchester and Liverpool to inspect the system of lighting there.

GENERAL.

THE Yarmouth Town Council has decided to expend £2280 for concreting various paths in the town and at Gorleston.

THE London County Council has decided to lend the Fulham Borough Council £24,145 for a dust destructor and street lighting.

THE report of the Medical Officer of Health for Redcar (Dr. Stainthorpe) indicates that the health of the town is very satisfactory.

THE Hastings Town Council has decided to apply to the Local Government Board for sanction to a loan of £2945 for street improvements.

THE Bootle Corporation contemplates loans of £8150 for Town Hall alterations and improvements, and £7000 for the cost of converting privies into water closets.

THE Leicester Town Council has resolved to not only purchase the local tramways, but substitute electric traction for horse-power. It is stated that the scheme will cost £500,000.

AT a recent meeting of the Aberystwyth Town Council the Finance Committee instructed the Town Clerk to secure the following loans:—Extension of promenade, £12,723; street improvement, £3046; and main sewer, £2900.

A LOCAL Government Board inquiry has been held at Pontypridd to inquire into the expenditure of £7930 for the erection of an isolation hospital for the district. There will be an administrative block, laundry block, and disinfecting block. The £9730 will include the cost of purchasing the site.

IN his annual report, Mr. Joseph Charlton, Sanitary Inspector to the Borough of Hartlepool, refers at some length to the housing problem. He says:—"The question of housing reform is one in which I take more than an official interest, and I am glad that a Committee has been formed to deal with this most complex and yet most important question. While I believe Hartlepool will compare favourably with other towns, it cannot be denied that the question of overcrowding and the necessity for new dwellings needs immediate attention if Hartlepool has to make progress or even maintain its position. The main question is the relief of the house famine by the provision of suitable houses at fair rents. If this were done, insanitary dwellings could be more readily closed, and cases of overcrowding dealt with, the respectable artisan would be prevented from becoming a slum dweller, and accommodation would be provided for those whose work brought them to the town."

DR. KING-WARRY, Medical Officer of Health for Hackney, says the *Times*, has, in compliance with the request of the Hackney Borough Council, prepared a report on the question of the housing of the working classes in his district. Dr. King-Warry points out that there were, according to the last census returns, 48,130 tenement dwellings in Hackney, and in one case it was shown that as many as eleven persons occupied a single room. The number of persons affected by overcrowding in Hackney is estimated at about 24,000. He thinks the following causes have exercised the largest influence:—(1) Inadequate building of workmen's dwellings; (2) increased cost of building materials and labour, leading to increased value of houses with corresponding rise in rent; (3) the disposition of late years to invest money in house property; and (4) the clearance of overcrowded and insanitary areas in other districts. Dr. King-Warry suggests that the difficulty might be met by the Borough Council's providing for the poorest part of the community a municipal lodging-house, to be under local control, and the price of accommodation to be fixed at the lowest figure sufficient to cover working expenses and a contribution to the sinking fund; while for those persons who constitute the poor of the district the Council might (*a*) purchase and convert any suitable large houses in the borough into tenement dwellings; (*b*) purchase land in the borough and erect suitable dwellings thereon at the cheapest possible rate; and (*c*) purchase land in the suburbs outside the borough for the same purpose. The charge should not be more than 1s. 6d. to 2s. per room per week to attract the poor classes. The dwellings for the very poor should not exceed 1s. to 1s. 6d. per week.

At the last meeting of the Hull and Goole Port Sanitary Authority reports were read from the Medical Officer (Dr. Wright Mason) and the Inspector (Mr. W. H. Crane) dealing with the recent outbreak of plague; the latter report describing the steamer Friary (which brought the plague cases to Hull) as being in a filthy condition. A circular had been sent to various Port Sanitary Authorities suggesting that the time had arrived when another effort should be made to induce the Government to pay out of the Imperial exchequer the expenses incurred by the Port Sanitary Authorities in taking precautions against the introduction into this country of cholera, plague, and yellow fever.

Last week a special meeting of the Sanitary Committee of the Middlesbrough Corporation was held for the purpose of considering the recommendations of a Sub-committee as to the disposal of night-soil. The Committee had several offers of barges submitted, and the Council, after considering the same, appointed the Mayor, Alderman Archibald, the Medical Officer, and the Sanitary Inspector, to arrange for the hire of barges required for taking manure out to sea for six months, from March 1st next. The Sub-committee having considered the cleansing and scavenging of the town, recommended (1) that during the six months when the manure is being taken out to sea the workmen be paid in accordance with the scheme of the Sanitary Inspector, and (2) that the Medical Officer and Sanitary Inspector be asked to consider and report on the question of the periodical cleaning out of the night-soil pans, and at the same time to prepare an estimate of the cost thereof. The recommendation of the Sub-committee was also adopted.

PERSONAL.

Dr. R. K. Brown has been appointed Medical Officer of Health for Bermondsey, at a salary of £500 per annum.

The salary of Mr. Charles Harrison, as Manager of the Accrington Gasworks, has been increased to £600 per annum.

Mr. James McMillan, C.E., has been appointed Engineer to the Motherwell New Waterworks at a salary of £350 per annum.

Mr. Chisholm, Peterhead, has been appointed Sanitary Inspector and Surveyor for Airdrie, at a salary of £200 per annum.

Mr. W. Curry, Surveyor for the urban district of Droylsden, has been appointed Surveyor for the urban district of Spennymoor.

Mr. C. W. Thompson, of Penrith, has been appointed Surveyor and Nuisance Inspector for Ripley, at a salary of £150 per annum.

The Local Government Board has sanctioned the reappointment of Mr. Shepheard as Medical Officer of Health for North Walsham.

Miss C. F. Stephens, of Bexhill-on-Sea, has been appointed Sanitary Inspector for the Bradford Corporation. There were twenty-four applicants.

The Local Government Board has sanctioned the reappointment of Dr. J. J. Jackson as Medical Officer for the Stanley Council, at a salary of £40 per annum.

Mr. Gerard J. G. Jensen, C.E., it is announced, will read a paper entitled "Notes on Certain Details of Drainage Construction," before the Society of Engineers on March 4th.

Mr. Archibald Dingwall has been reappointed Medical Officer of Health for the urban district of Kington, and Mr. Wm. Price has been reappointed Inspector of Nuisances.

The Richmond Town Council has appointed Dr. J. H. Crocker, Medical Officer of Health of Eccles and Port of Manchester, as Medical Officer of Health of the borough. The salary is £450 per annum.

Mr. Percy Cammidge, of the Yorkshire College, has been appointed to the newly-created office of Bacteriologist to the West Riding County Council, that body having decided to carry on researches into biological matters under the direction of its own Medical Officer.

The Poplar Borough Council has increased the salary of Mr. A. Blackman, borough electrical engineer, to £400 per annum, and that of Mr. F. W. Alexander, Medical Officer of Health, to £550 per annum.

Mr. Rowley Hill, son of the late Bishop of Sodor and Man, and late assistant-engineer to the Bromley Electric Light Company, Limited, has been appointed Manager of the Harrow Electric Light Company, Limited.

Mr. J. J. Crawford, Resident Medical Officer at the Victoria Hospital, Burnley, has been appointed Assistant Medical Officer at the Leeds Workhouse Infirmary, at a commencing salary of £130 per annum, rising to £150.

Mr. G. S. Perkins, pupil to Mr. T. J. Moss Flower, A.M.I.C.E., of 2, Victoria-mansions, Westminster, S.W., and 28, Baldwin-street, Bristol, has been appointed second engineering assistant to the Walthamstow Urban District Council.

Mr. Geo. Livingstone has been appointed temporarily as city Engineer and Surveyor to the City of Westminster. He is to continue to perform his duties as Surveyor of the Parish of St. George, Hanover-square, at a salary of £83 6s. 8d. per month on condition that he undertakes not to apply for the permanent appointment.

Mr. A. H. Shaw, who has been appointed as chief electrical engineer to the Ilford Urban District Council, and is shortly leaving Harrow, was recently the recipient of a handsome brass inkstand from the employés of the Harrow Electric Light Company, of which he has been chief since the works of the company were transferred from Messrs. Crompton and Co., who carried out the first installation.

NOTES AND QUERIES.

Subscribers may obtain advice on matters appertaining to Public Health Law and Municipal and Sanitary Engineering. Letters should be addressed "Notes and Queries," The Sanitary Record, 5, Fetter-lane, London, E.C. If an answer be required immediately, a stamped addressed envelope must be enclosed

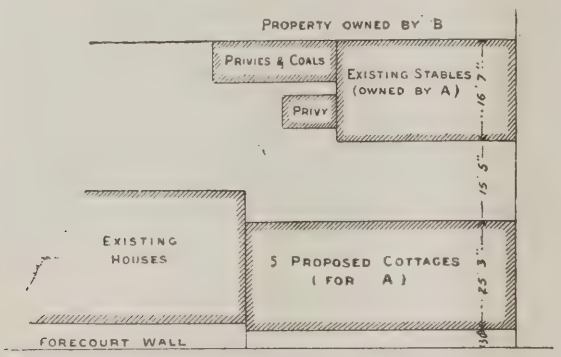
2094.—Food and Drugs Acts: Sanitary Inspector may obtain Samples.—"C. S. I." writes:—"Having been appointed Inspector of Nuisances to an Urban District Council, is it part of my duty to take samples of food, including milk and drugs? If so, is it necessary to have resolution of Council before taking samples, or should the samples be taken and sent for analysis and the matter reported? I have not been appointed Inspector under the Food and Drugs Act. Is this necessary? I understand the police have been taking samples in my district."

Answer.—If the Inspector of Nuisances has been appointed subject to the approval of the Local Government Board, his duties are defined by the General Order of the Local Government Board of March 23rd, 1891, and this order prescribes that the Inspector shall, when and as directed, procure and submit samples of food, drink, or drugs suspected to be adulterated, to be analysed by the analyst appointed under "The Sale of Food and Drugs Act, 1875," and upon receiving a certificate stating that the articles of food, drink, or drugs are adulterated, cause a complaint to be made and take the other proceedings prescribed by the Act. The querist is therefore in error in supposing that he has not been appointed Inspector under the Food and Drugs Acts, for every Inspector of Nuisances appointed under the order referred to is by virtue of his appointment an Inspector of Food and Drugs. If the Sanitary Authority require the Inspector of Nuisances to procure and submit samples of food, &c., they should direct him, as provided by Clause 8 of the order before referred to, by resolution or otherwise to do so.

2095.—Building Bye-laws: Open Space at Rear of Buildings.—"Surveyor" writes:—"I submit block plan showing five proposed cottages. The Model Bye-laws of the Local Government Board are in force in the district. The architect contends that according to Bye-law 54 he is not compelled to provide 20ft. between the rear of the houses and the existing stables (the houses are over 25ft. in height measured to half the height of the roof), inasmuch as he has provided 150 square feet—which space is free from any erection—as required by the bye-law; and he further maintains that the 20ft. specified refers to the distance from the boundary of the lands of a separate owner at B. He also wishes to bring the buildings forward in front as shown, in order to have 15ft. at the rear, but maintains the line of the existing forecourt walls. My contention is that the whole of the bye-law must be taken collectively, and that it is not sufficient to provide 150 square feet of space free from

erection, but that 20ft. must be allowed between the rear of the buildings and the boundary of the lands or premises immediately opposite—in this case the wall of the stables. Would you kindly give me a correct interpretation of the bye-law in question, and advise generally on the case?"

Answer.—The Local Authority are not enabled to approve the plans of the proposed houses, as they contravene the bye-laws in several respects:—(1) An open space is not provided exclusively belonging to each building, and of an aggregate extent of not less than 150 square feet, *i.e.*, that the open space for each house shall be distinct and fenced off separately. In this case the space at the rear is common to all the houses—see Bye-law 54. (2) By the same bye-law, where the height of a new domestic building is to be 25ft., the open space must extend from the rearmost wall of the building—whether it be a kitchen and scullery which project at the back, or the main back wall if no such projecting scullery is to be constructed—for a distance of 20ft. at the least. Such space must be free from any erection above the level of the ground except a water-closet, earth-closet, or privy, and an ash-pit. This distance must be, as clearly specified by the bye-law,



measured to the boundary of any lands or premises immediately opposite or adjoining the site of such (proposed new) building. In the plans submitted this distance must be measured to the wall of the stables nearest to the houses, which wall is the boundary of premises immediately opposite. As such distance is 15ft. 5in. and not 20ft., the bye-law cannot be complied with. The builders' contention that the distance referred to is to be the boundary of the lands of a separate or another owner is absurd. By such an interpretation it would follow that the back wall of the proposed cottage may be built to within 4ft. of the stable, as this would then leave 20ft. to the boundary of his premises. (3) The bringing forward of the main front wall of the houses as shown beyond the main front wall of the adjacent houses would be a contravention of Sec. 3 of the Public Health (Building in Streets) Act, 1888, rendering the builder liable to the penalties provided by the section, unless he first obtains the consent in writing of the Urban Authority.

2096.—Housing of the Working Classes: Dilapidated Houses. — "C. M." writes:—"There are some dilapidated cottages in my district, the rental of which varies from 1s. per week to £4 a year. In most cases the owners promise repairs, and so the tenants stay on in the hope that something will be done. Eventually, however, they are driven to leave, as the cottages become positively unfit to live in, and are often unsafe. Will you please advise whether an unfulfilled promise from an owner to make a cottage safe and habitable will release an occupier from the obligation to give notice?"

Answer.—If the cottages, being under a rental of £8, were not at the commencement of the tenancy in all respects reasonably fit for human habitation, then, and only in such a case, will the tenancy be determinable without notice. By Section 75 of the Housing of the Working Classes Act, 1890, it is enacted that in any contract made after the 14th day of August, 1885, for letting for habitation by persons of the working classes, a house or part of a house there shall be implied a condition that the house is at the commencement of the holding in all respects reasonably fit for human habitation. In this section the expression "letting for habitation by persons of the working classes" means the letting for habitation of a house or part of a house at a rent not exceeding £20 if the hereditament is in the metropolis, or £13 if in Liverpool, or £10 if in Manchester or Birmingham, or £8 if situate elsewhere. The section applies in the case stated by the querist, inasmuch as the rentals are less than £8, and if as beforementioned the cottages were not at the commencement of the holding in all respects reasonably fit for human habitation, then the tenants may repudiate the contract and cease to be liable in respect to it. Moreover, if a tenant suffers damage by reason of the insecure or insanitary condition which existed at the commencement of the tenancy, such damage may be recovered from the owner, notwithstanding that no guarantee, verbal or written, was given by the owner. In Walker *v.* Hobbs, 23 Q.B.D., 458, a husband and wife took three rooms in a block of buildings at Bermondsey at a rental under £20 per annum. At the time of letting, the plaster was insecure, and soon after some fell, and some months after more fell, which latter injured the female plaintiff. It was held that the plaintiffs were entitled to recover compensation from the owner.

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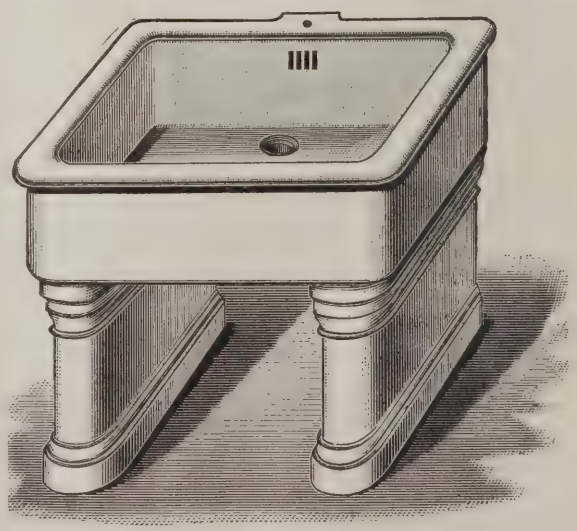

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TUBERCULOSIS—INFECTION, HEREDITY, PREVENTION, HYGIENIC TREATMENT.

By A. G. Young, M.D., Secretary State Board of Health, Maine, U.S.A.[1]

(*Continued from page* 160.)

Infection from husband to wife and vice versâ.—Behnke[20] relates the following case: A man with a phthisical tendency married a well and strong young woman. He died in five months from their marriage. After his death the widow began to show signs of consumption; nevertheless she married again and died of consumption a year and a-half from the time of her second marriage. This second husband married a widow, but soon showed unmistakeable symptoms of lung disease. He died of consumption a year and a-half later. About a year afterwards the twice widowed woman married a well and robust man. Three years later he died of consumption. Though the widow was well-to-do, the foregoing history was so remarkable that no man would marry her.

A large number of cases of conjugal tuberculosis might be cited here, but it must suffice to remark that the transmission of tuberculosis from husband to wife or from wife to husband is of quite frequent occurrence. On the other hand the instances are many in which infection does not occur.

Because it often happens, says Cornet, that tuberculosis is not transmitted from tuberculous husbands to their wives, or *vice versâ*, it is illogical to adduce these facts as evidence of the non-infectiousness of the disease. The closeness of the association of married life is often over-estimated. The work of the husband often keeps him away from his home more than half the time. In many cases separate beds or separate rooms are occupied. In many cases of consumption too, expectoration is slight or absent during the hours of rest, but is greatly increased during the hours of exertion. The husband may, therefore, expose his fellow-workmen, in shop or in factory, to much greater danger than he does the members of his own family. The exposure of the younger children to household infection is usually much greater than that between husband and wife.

Infection in offices, shops, and factories.—At the last French congress on tuberculosis, Dr. Oberthur[21] asserted that tuberculous contagion among the workmen in offices, workshops, and factories is very frequent—much more frequent than is often believed. Energetic measures are taken to preserve the lives of workmen from toxic products which surround them. It is none the less necessary to introduce measures against tuberculosis, which causes among the working population far greater ravages in a single year, than phosphorus, lead, mercury, fire-damp, and machinery in a century.

The next two following cases, selected from the many investigated by Cornet,[22] illustrate clearly the great danger to the fellow-workmen of consumptives who spit upon the floor of their workshops or places of indoor business.

Case 295. Admitted to the hospital in 1892. Bernard B., 29 years, single, a turner. The mother died in 1870 in childbed at the age of 42 years. The father died in 1875 from a disease of the stomach. Neither among the grandparents nor the brothers or sisters of the parents had there been a case of tuberculosis. A brother 25 years of age died of disease of the heart, and six brothers and sisters whose ages range from 32 to 50, are well.

In the shop where the patient worked from 1887 to 1892, a man O., died of consumption in 1889; then another workman who was much with O. died of the same disease. In 1889 the patient Bernard B. was troubled with spitting blood. Since 1891 his master, whose father died at the age of 61 of senile debility, and whose mother is well, died of tuberculosis. In the autumn of 1892 Fritz St., who had worked for four years as an apprentice in the shop, became tuberculous. The workshop is large and well ventilated, but these tuberculous persons had spit upon the floor, and the floor was swept dry.

Case 347. Admitted, 1892. Emil K., forty years, married, a cabinet maker. His father and mother are both living and well, the former at the age of seventy-six and the latter at the age of seventy-five years. The grandparents died at the ages of sixty-six and sixty-nine from other causes than pulmonary. A brother and sister, forty-seven and forty-nine years of age respectively, are well. One brother, twenty-six years old, died of an unknown disease. This patient, Emil K., works in the shop of a man by the name of Basch.

From 1869 to 1878 Basch worked in his small shop with Heymann. Heymann died of tuberculosis in 1878. Basch, with no hereditary tendency, showed symptoms of the disease in 1878, and died in 1889. A workman by the name of Gold died in 1880; another, Belke, in 1885. All of these persons died of consumption. Emil K., whose case led to the investigation of the history of this workshop, was supposed, early in life, to be scrofulous. He worked near Belke, and showed signs of infection in 1886 at the age of thirty-four. He died in 1892. Hanof, in whose family there previously was no history of tuberculosis, and has worked in the same shop since 1886, is now tuberculous. The eldest son of the master Basch, who took charge of the business after the death of his father, is, according to the testimony of his fellow-workmen, suffering from consumption.

Emil K., warned by his attending physician, and because his wife would not allow him to do otherwise, always spat, while at home, into a vessel containing water. His wife at the time of the investigation was forty-six years of age, in good health, as were also her two children, twelve and sixteen years of age.

In this workshop, where in the later years as many as thirteen persons worked, there were no spittoons, and it was their practice to spit upon the floor, which was always swept in the dry way. As in many other cases, there was here at first no indication of the sources of contagion of these patients. That was made evident only after an investigation of the condition of the workshop, and the conditions under which these persons worked took place.

Tubercle bacilli are found, as a rule, only in those places in which a careless or uncleanly consumptive lives or works, but, in the absence of knowledge of the chances of infection, we cannot rationally conclude that a man has not been exposed to infection. Many consumptives still at work, expectorating large numbers of bacilli, are unthought of by the laity as sources of infection, and are unknown to the physician until a careful investigation has been made.

Cornet presents statistics on the death-rates of various classes of workmen in confirmation of his statement that the consumptive patient, while he is able to work, endangers his fellow-workmen much more than he does his family, particularly when he and his fellow-workmen do their work in closed rooms.

As related by Professor Märfan,[23] he was consulted about the prevalence of pulmonary tuberculosis in an office in Paris in which twenty-two employés worked. In 1878 one of the number died of consumption, and since then deaths from phthisis followed each other in rapid succession. In four years ending in 1889 thirteen employés succumbed to tuberculosis. Investigation

[1] Reproduced, by special permission of the author, from the eleventh report of the Maine State Board of Health, U.S.A.

[21] "Congress pour l'Etude de la Tuberculose," page 405. 1898.

[22] "Die Tuberculose," page 223. 1899.

[23] Rev. de la Tuberculose, v., 322. 1897.

showed that the hygienic conditions were bad—there were insufficient light and air supply. But the essential cause of the prevalence of the disease was attributable to the fact that the employés were in the habit of spitting upon the floor, and dried and pulverised sputum was put into motion in the air by the daily sweeping. The sweeping had been done in the morning, and the employés often arrived before the sweeping was finished, thus they were forced to inhale this infectious dust when it was most plentifully present in the air. In accordance with the advice of Dr. Märfan the old floor was taken up and burned, the place was repainted and otherwise renovated, a plentiful supply of spittoons were put in, and the use and care of these were kept under strict surveillance. The result was that, at the end of eight years, no new case of consumption had appeared among the employés.

Infection from transitory cases.—Infection is sometimes transmitted from transitory cases which may not be recognised as tuberculous.

Dr. Ducor[24] gives the history of two cases of infection from such a tuberculous attack in the mother. There was no history of tuberculosis on either side. The father, a man of forty-one years, had always been hale and hearty. The mother, forty years of age, suffered for a year from bronchitis which followed exposure to tubercular infection. She recovered, but the next to the youngest child, a girl of three years, had two tuberculous swellings, one of the hand and one of the knee. The youngest child at the same time had tubercular swellings of the cervical glands. By means of surgical and other help the children recovered. The seven older children in the family remained unaffected. Thus the only persons affected were the youngest two, who were naturally more exposed to the infection than their elder brothers and sisters with ages ranging from six to fifteen.

Outbreaks of tuberculosis in isolated communities.—In a few places tuberculosis is unknown; in some other places its introduction has occurred within the period of trustworthy history; in a larger number the movements of population have carried with them an increasing wave of tuberculous disease to the earlier or aboriginal peoples among whom hitherto there had been but a slight prevalence of the disease.

Dr. Frederick A. Cook, who accompanied Lieutenant Peary's Arctic Expedition, says that tuberculosis is very prevalent among the Esquimaux of South Greenland. In the Arctic Highlanders, however, tuberculosis is unknown, simply because the bacillus has never been carried to them.

In Terra del Fuego phthisis was absolutely unknown until an English missionary station was established in that district. The wife of the missionary, a consumptive opened a school, and soon many of the children succumbed to her disease.[25]

At the last meeting of the Congress of Tuberculosis in Paris, Dr. Ricochon[26] communicated the history of an outbreak of tuberculosis in a village where that disease had hitherto been of rare occurrence. He knew of three cases only before this outbreak, and they occurred more than fifteen years before. The village is situated on elevated and permeable calcareous ground. The houses are neat and well ventilated. The water supply comes from springs, and is of excellent quality. The people are cultivators of the soil, habituated to a life in the open air.

Case 1.—In 1894, a young woman of thirty years of age had a swelling of her foot which eventuated in an ulceration which resisted repeated cauterisation and other treatment, and which assumed a character of a tuberculous ulceration. In 1896 she was attacked with pulmonary tuberculosis and died one year later. Thus far neither her husband, her two children, nor the domestics of her house, have shown signs of contamination; but the neighbouring houses have presented cases of tuberculosis.

Cases 2 and 3.—In the next house, a young woman of twenty-eight years had a dry pleurisy of the right side in 1896, which came on insidiously and which threw her into a condition of marasmus for three months, which appeared to be of tuberculous origin. During this same period of time, a child, six years old, who had measles two months previously, and who had remained in a feeble condition since then, was attacked with tubercular meningitis and died.

Cases 4 and 5.—In the house situated next in order, a woman of thirty-eight was attacked in March, 1896, with a grave form of tuberculosis of the cervical vertebræ from which she died in November. Meanwhile, one of her children, a little girl of ten years, was attacked with dry pleurisy of the right side, from which she recovered.

Case 6.—In the next house on the same street, a child of five years died after an illness of eight days of tuberculous meningitis. Some months before it had measles.

Cases 7 and 8.—In a house upon another street near the cases two and three, a woman, forty-nine years of age, whose health hitherto had been perfect, began to cough at the end of the year 1895, and died of pulmonary phthisis, July, 1896. Some months afterwards, her husband, previously strong and vigorous, began to cough, and died of pulmonary phthisis in May, 1897.

Case 9.—The sister-in-law of these last two patients, one of the most robust women of the country, who, off and on, took care of them during their illness, was attacked with a dry cough and a pain in the back of her shoulders. There were signs of the dry pleurisy over the posterior superior two-thirds of lungs. Her condition at the end of two years still remained serious, though there was slight amelioration. She had profuse sweats, hectic fever, and other evidences of tuberculosis.

Case 10.—A girl eighteen years of age, whose paternal line had a slight tuberculous taint (an uncle died of tuberculosis at the age of twenty-two years) but the health of this young woman had always been good until she contracted bronchitis in the course of which she had two very pronounced attacks of hemoptysis. Submitted to a vigorous treatment, she improved and has gained in weight.

Case 11.—A woman of thirty years, who had had but one child, and whose health had always been excellent, and whose parents died of old age, as most of the parents of the preceding patients had, has for some weeks past had a serious effusion into the left pleura, which I have already tapped twice. Disseminated bronchial rales on the right side are of a suspicious nature.

Case 12.—A young man of thirty-two years living near the first case, whose health had habitually been good, began to cough and had a serious hemoptysis last May. Upon examination there were already crackling rales at the summit of the right lung. He became emaciated and lost strength. He was submitted to an intensive treatment with creosotol, phosphate of lime, and chlorid of sodium. There has been an improvement in his appetite, and, in the last few weeks, an improvement in weight.

Here, says Dr. Ricochon, are the facts. After an absence of tuberculosis for fifteen years in a village, and after the re-appearance of a case of that disease, ten or twelve other cases followed in the houses of the nearest neighbours in less than a year. The map of the village, which the doctor presents, showing the location of the infected houses, added to the interest of his paper. The cases all appeared upon or near one line of streets, while no cases appeared in the houses grouped along the one other street.

(*To be continued.*)

[24] "Congres pour l'Etude de la Tuberculose," 1893, page 48.

[25] "Revue d'Hygiene," xii. 50. 1890.

[26] "Congres pour l'Etude de la Tuberculose," 1898, page 773.

ANNUAL REPORTS.

Eston.—The annual report of the Medical Officer of Health (Dr. F. Fulton) was presented to the Eston Urban Council last week. During the past year there had been 393 births registered and 240 deaths. Refering to the number of deaths due to diseases of the respiratory organs, the Medical Officer stated that he had to repeat what he said last year, that owing to the nature of the employment of so many of the population this was likely to continue. The sudden change of temperature from the works to the cold and damp of the outer air, more especially in the cases of those badly clothed and ill-fed, must affect most injuriously the lungs, the air passages having been already more or less irritated by the solid particles suspended in the air of the works. This, in his opinion, was a more important cause than any specific microbe, which had been so much talked about, as producing pneumonia in these parts. There had been 37 cases of tuberculosis as against 28 last year, and the Medical Officer asked, as they are preventible diseases why are they not prevented. This might be done, he stated, by boiling the milk used immediately.

Perth.—Mr. Duncan Cumming, Sanitary Inspector of Perth, has just issued his report for the year ending 31st December, 1900. It states that there were 170 complaints as to nuisances registered, and 68 discovered by him at periodical inspections, showing a total of 238, as compared with 158 the previous year, being an increase of 80. All these nuisances were dealt with, and in almost all the cases the authors, on being informed concerning them, took prompt steps to have them removed. Two hundred and thirty-three notices were served under Section 19 Public Health (Scotland) Act, as compared with 93 the previous year. Two samples of water were taken from the river Tay during the month of June—one from the west and the other from the east side of Moncrieffe Island, near the filter bed. The samples were submitted to Messrs. Tatlock and Thomson, City Analysts, who reported that the samples were quite clear, and were quite free from even the slightest trace of contamination by matter of the nature of sewage, and they were of opinion that they were well adapted for drinking, cooking, and general dietetic purposes. A sample of water was also taken from a mineral spring called Shaw's Well, near Craigie Burn, as it had been suggested to the Town Council by a citizen that the site of this valuable spring should be marked in some way or another by the erection of a fountain. The report of the analysts stated that the water was quite free from even the slightest trace of contamination by sewage matter, and was in every respect well adapted for drinking and general dietetic purposes. The number of inspections made of common lodging-houses during the year was 159, as against 91 the previous year. The houses were found clean and in a fairly satisfactory condition, but in many cases were old buildings. Sixty-nine inspections were made of dairies and cowsheds, compared with 109 in 1899. A case of anthrax occurred in one of the byres. Prompt measures were at once adopted for isolation of cattle and stopping the sale of milk, and the byre was disinfected. No further outbreak occurred. No diseased meat had been seized. The inspections of the slaughter-house number 157, as against 108 the previous year. Seventy-five samples of food, &c., were purchased during the year, an increase of fifty-six over last year, and, with the exception of one of milk, all were genuine. A conviction was obtained in the case of the milk. Mr. Cumming had eleven samples of beer analysed on account of the reports that beer in several counties in England contained arsenic, but the result of the analyses showed no arsenic. Twenty-two inspections were made to workshops, as compared with fifteen the previous year. Nine complaints were received from her Majesty's Inspector of Workshops, and all these were promptly attended to. The total number of cases reported under the Infectious Disease (Notification) Act, 1889, was 160, and the number of cases reported the previous year was 380—a decrease of 220. The epidemic of scarlet fever declined during the month of February, and almost entirely disappeared in May and June. That disease still showed the greater number of cases, although during the month of December only two cases were notified. The small-pox hospital, which had been opened for the reception and treatment of scarlet fever patients on 12th August, 1899, was finally closed on 23rd February, 1900, and the services of the nursing staff dispensed with. The interior was thoroughly disinfected, cleaned, and made ready for the reception of patients. The number of patients admitted during that period was fifty-five, and the total cost (including clothing, bedding, and furniture) was £391 17s. 7¾d., and the actual cost per patient £5 12s. 4½d. Reference was also made to the arrangements with the Infirmary Directors regarding the treatment of infectious diseases. There were 1162 statutory and other notices issued, while the total number of inspections under the Public Health Acts was 1883. The report concludes with a reference to the precautions against bubonic plague and the disinfection of infected clothing, &c.

Truro.—Dr. Bonar, Medical Officer of Health to Truro Rural District Council, in his report for 1900 states that the district comprises 23 parishes, with an acreage of 84,157, and a population in 1891 of 22,557. The births were 256 males and 268 females, equal to a rate of 23·14 per 1000 of the population; and the deaths, 196 males and 220 females, a rate of 18·37 per 1000. Natural increase, 108; infantile death-rate, 99·2; zymotic death-rate, ·57. Deaths from zymotic diseases —Scarlet fever 2; enteric or typhoid, 6; diphtheria, 1; erysipelas, 1; diarrhœa and dysentry, 3. Classification of deaths from other diseases—Epidemic influenza, 20; enteritis, 1; phthisis 35; other tubercular diseases 8; cancer, 20; bronchitis, 49; pneumonia, 16; pleurisy 1; other respiratory diseases, 1; cirrhosis of liver, 2; premature birth, 8; parturition accidents, 2; heart disease, 45; accidents, 11; all other diseases, 184. Inquests held during the year, 27. Of the above total (416) 52 died under 1 year; 13 between 1 and 5 years; 17 between 5 and 15; 19 between 15 and 25; 112 between 25 and 65; 203 over 65. There were 235 cases of infectious diseases notified during the year:—Diphtheria, 5; erysipelas, 27; scarlatina (scarlet fever), 184; enteric fever, 17; continued fever, 1; puerperal fever, 1. The cost of the working of the Notification Act during the year was, to each of the 23 parishes in the Union, per week, about 5½d. Diseases prevalent during the year were measles, scarlet fever, and mumps. Special sanitary work and expenditure—Drainage, £57 8s. 11d.; water supply, £35 10s. 3d. Water supply considered deficient at St. Agnes (being provided for), Perranporth, Wheal Rose, St. Mawes, and Rose. Drainage considered imperfect at Chasewater, Mount Hawke, Perranporth, and St. Mawes. 526 notices to abate nuisances were issued during the year; 29 plans of new buildings were presented to the Sanitary Committee; certificates of occupation granted to 22 new houses under Public Health Act, 1878; all elementary schools inspected, limewashed, cleaned, &c., where necessary; a large number of dip wells supplied with pumps, many cleaned out and repaired; privies and ashpits, between 50 and 60 built, and over 90 repaired; slaughter-houses and dairies inspected during the year; three walls were condemned during the year, and analyses of three waters made.

THE HOUSING QUESTION.

MEETINGS AND MOVEMENTS.

Mansion House Council.

Mr. H. Leonard presided at the monthly meeting of the Mansion House Council on the dwellings of the poor. The report showed that insanitary conditions had been attended to in ten districts. The number of houses dealt with during the month was 835, and 346 had been reported to the Authorities.

Debate at Chelmsford.

A discussion on this question was opened by the Rev. J. D. S. Perry-Evans at a meeting of the Chelmsford Debating Society, Mr. C. Williams presiding.

Mr. Parry-Evans, who moved a resolution in favour of Government action being taken in respect of the housing of the poor, as the increased cost of building sites and building materials was out of proportion to the advance in wages, gave an outline of the miseries which are produced by overcrowding, some of the instances he cited being the result of his personal investigations in London in the neighbourhood of Drury-lane. He dealt successively with the causes of overcrowding—the difficulty of obtaining building spaces, the necessity of the workers living near their employment, high rents, the immigration wave from the country town-wards, and the demolition of houses for improvements of various kinds; and he showed how these factors in the problem operated in bringing about the deplorable evils that are universally admitted to exist. In concluding a very able address, he urged that a remedy lay in the delegation by Government of a full measure of authority to Local Councils to provide dwellings for the workers, and to erect cheap lodging-houses for the migratory classes.

Mr. J. A. Webb seconded the motion.

Mr. F. W. B. Stocker proposed an amendment to the effect that no Government action was necessary, as, under the Housing of the Working Classes Act, 1890, Local Authorities had power to deal with the question.

Mr. J. O. Thompson seconded the amendment; and Messrs. G. H. Coleman, H. Barnes, W. Bewers, P. H. Soames, and W. Cutts also took part in the debate.

Eventually the amendment was carried.

Inquiry at Prescot.

Mr. H. H. Law, one of the Local Government Board's inspectors, held an inquiry at Prescot into an application by the Prescot District Council for the confirmation of a scheme of improvement under the Housing of the Working Classes Act, 1890. There was a good representative attendance.

It appeared from the details given by the officials of the District Council that the scheme included the demolition of a considerable number of alleged insanitary dwellings and the construction of a new street, 36ft. wide, from High-street to Eccleston-street, two of the principal thoroughfares of the town. It was explained that the amount of outstanding loans at present was £1900; the assessable value of the district was £19,288; and the population was estimated at 8000. The Council did not intend to touch the question of the rehousing of the people who would be displaced; but preferred to leave it to individual enterprise, which, it was thought, would meet the requirements. The affected area No. 1 of the proposed improvements comprised 4658 square yards, and the population, including lodgers, was 166. The gross rental was about £302. The estimated total cost of the improvement for that area was £5574 11s. 10d., including the construction of the new street, compensation, &c. The area No. 2 comprised 590 square yards, with a population of 32, and the estimated cost of the work was £700 3s. 7d.

Dr. E. F. Hall, Medical Officer of Health, said the present buildings on the affected areas were a danger to public health, and, in his opinion, the improvements were necessary.

Mr. H. Leyland, surveyor, said the surplus land would hold twenty-two new houses after the proposed new street had been made.

Mr. F. W. Halsall remarked that there was not at present one empty house in either of the areas.

The Inspector said that pointed to the fact that it was incumbent on the Local Authority to provide dwellings for the people who would be displaced. No matter how poor the people were, they must be provided with cottages.

Dr. Hall, in reply to a question, said he thought the land gained by the improvement would be too valuable for ordinary cottage property.

Mr. E. Tracey, secretary of the British Insulated Wire Company, and Mr. James Berry, of Prescot, also spoke in favour of the scheme.

At the close of the inquiry, the Inspector proceeded to visit the areas included in the scheme.

Deputations to the President of the Local Government Board.

A deputation, consisting of members of the National Housing Council, and several prominent trades unionists, waited upon Mr. Walter Long, President of the Local Government Board, with reference to the housing of the working classes. Mr. W. C. Steadman explained that they desired the Board to extend the period for which loans were granted. At present sixty years was the limit allowed; but buildings were being erected by the municipalities which would last two hundred years. If the Board would extend the period, municipalities would be able to reduce the rents, and materially contribute to the better housing of the poor.

Mr. Long, replying, said the difficulty of dealing with the question was that people wished to live where they found employment, and did not realise the conditions under which they lived. There was considerable misapprehension respecting the attitude of the Local Government Board. As regarded the extension of time, Parliament had been stricter than the Board, and had thought that any extension would involve great risk, which, in the interests of the ratepayers, should not be incurred. The Department had to see that the money of the ratepayers was so spent that the interests of all classes were reasonably protected. Were they sure the extension of the period of the loans would give them the relief they desired? As to the building regulations, some confusion prevailed. In London they were imposed under the London Building Act, and in rural districts by the Local Authority, framed as model bye-laws. Before these were objected to it should be shown they were unreasonable and unwise. Their object was to secure the erection of good buildings, of good sanitary character, and with proper air space. Nothing would give him greater satisfaction than to be able to lessen the difficulties of the Local Authorities. The fact that the London County Council was making a large step in this direction showed that the new powers under the Act of 1900 would be of advantage. With regard to the need for improved means of communication, trains would follow the population, and there was reason to suppose that we were on the verge of a vast improvement in locomotion.

The deputation thanked the right hon. gentleman and withdrew.

THE INSTITUTE OF SANITARY ENGINEERS

(Incorporated).

OFFICIAL TRANSACTIONS.

NEW YEAR'S PRESIDENTIAL ADDRESS.

By Dr. J. B. Wilkinson, D.P.H., &c., M.O.H. County Borough of Oldham, and Consulting M.O.H. County of Huntingdonshire.

(*Concluded from page* 169).

THE SLOP CLOSET.

Probably the earliest form of closet, which has any characteristics similar to the ordinary slop closet, is that which may still be found in country districts, viz., a seat placed over a small stream or on the immediate bank with a slope leading from under the seat down to the stream. Though a very ready and convenient way of disposing of refuse, it is not a method which can find any word of approval. A very similar method was the original slop closet, except that the stream of water has its place taken by the smaller stream of sewage and slop water coming from the adjacent house. For purposes of general description the slop closet consists of two forms, one known as the "automatic" and the other in which the sewage simply flows through the pan. The simplest form of the latter is a seat placed over a basin or large pipe, which is connected with a trap beneath leading into the sewer, and a pipe conveying the sewage opening into the closet just above the trap (Fig. 1). The excreta falls into the trap, and

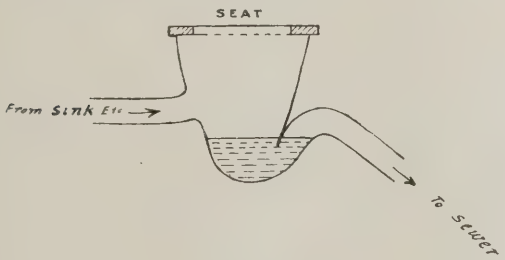

Fig. 1.

the slop water, &c., as it comes from the house carries it away into the drain. At least that is what it ought to do, but I think the general experience is that this action is by no means so regularly carried out, and that frequent blockages of the trap occur, necessitating some hand flushing to carry off the refuse; the fault of this form of closet being that the sewage does not flow with sufficient force to carry with it the solid material. This kind of closet has been introduced under various names, perhaps the earliest was known as the Southport closet, followed by the Fowler closet, and later by the Birmingham closet, the latter being associated with the name of Dr. Bostock Hill. An earlier form than any of these was the Bristol eject, in which a brick basin lined with cement was connected by a trap to the sewer, and the closet had to be flushed by hand, and therefore is hardly a true

WASTE-WATER CLOSET.

The next stage in the improvement of this class of closet was with the intent of storing up the water so as to give sudden and forcible flushes of water to thoroughly clear the closet and trap beneath it. A cistern was attached into which the slop water ran, and which, when full, emptied itself rapidly by means of a syphonic arrangement, very similar to some of the automatic flushing cisterns for clean-water trough closets and latrines in use to-day. The objection to this arrangement lay not in the closet, but in the slop water, which often contained pieces of paper or straw, grease, or other solid material sufficient to stop the action of the syphon, which was eventually for this reason discarded. I am not sure, but I believe it is due to Mr. Duckett, of Burnley, that the present improved form of automatic stop closet was introduced. The improvement consisted of the introduction, in connection with the closet, of a basin into which the sewage falls, and which when full tips over, discharging its contents suddenly into the closet, and flushing out any material which has accumulated in it, and then regaining its position for filling again. The basin, or "tipler" as it is called, usually holds about three gallons of water, but in closets on the latrine plan considerably more. The tipler is placed in such a position that the slop water, bath water, and, if possible, rain water, will flow into it. This improved closet is now made under several names, each varying somewhat in their arrangement. Practically there are, however, two types, one in which the tipler is placed in some position *between* the closet and the sink, and the other in which the tipler is placed *in* the closet and immediately under the seat, so that it receives in addition to the water the excreta, and discharges both, when full, into the trap beneath. As a type of the former, the closet made by Messrs. Duckett, of Burnley, may be taken as the one best known; and of the latter, that made by Messrs. Day, of Wolverhampton, and known as the "Stafford" closet. As far as I am aware, this is the only closet in which the tipler is placed under the seat itself; in all the others the tipler is in some position between the closet and the water supply, generally the sink.

A brief description of the arrangement of a Duckett closet is as follows :—The slop stone pipe and, if possible, the rain-water pipe, discharge on to a dish stone, placed over an ordinary syphon trap, from which a 4in. or 6in. drain leads to the closet. The closet itself consists of a large earthenware receptacle, in one end of which the tipler is fixed, and a pedestal is fixed over the other half. The trap leading to the sewer is immediately under the pedestal. The drain from the slop pipe discharges into the tipler. Originally the tipler was placed under the slop pipe and away from the closet, but it was found that the force of the flush was broken by the flow through the drain.

The special feature of the Duckett closet (Fig. 2) is

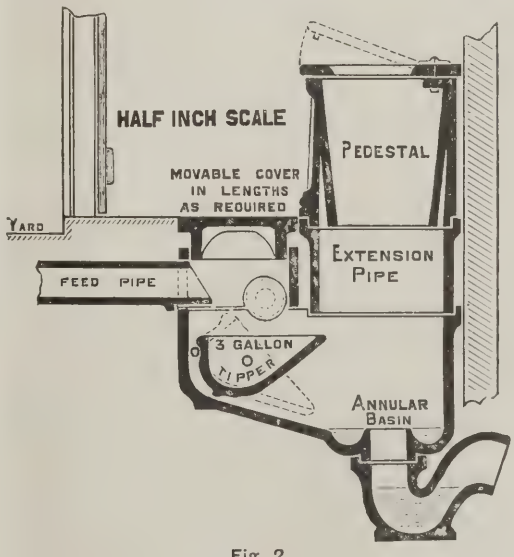

Fig. 2.

that the trap leading to the sewer is a comparatively small one, and its opening is surrounded by a small circular water channel called the annular basin, which retains water after flushing, so that excreta falling from the pedestal either drops into the trap itself or into the

water in this channel, there being only the narrow edge of the trap between the two.

The tipler is usually of a three-gallon capacity,and the discharge from it is projected on to the annular c hann at a tangent (Fig. 3), so that the flow takes a circular course round the trap until meeting a stop, when the water goes over into the trap, carrying with it any

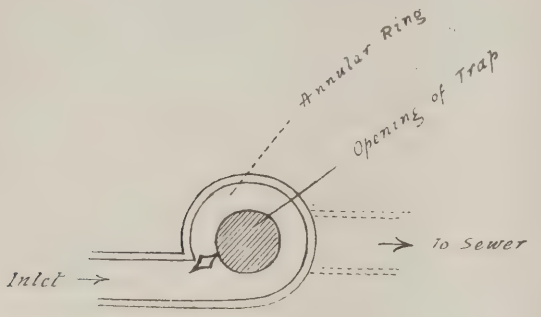

Fig. 3

solid material which may have accumulated. Several forms of seats can be used, but the best and simplest form is the pedestal with an ordinary hinged seat, or in low-class districts a pedestal with a wood rim screwed to the edge of the pedestal.

The tipler is best placed beneath the closet floor and covered by a removable flag or iron cover, so that the tipler can be easily reached in case of damage. Another feature of this form of closet is that in some the lower opening of the pedestal is specially contracted into a quatrefoil shape. This prevents large articles reaching the trap, and does not much impede the progress of excreta. It, however, leaves an angle beneath this contraction which cannot be readily cleaned. A later improvement has been brought into use by the same firm in which the slop water, when discharged from the tipler, enters the basin of the closet round the rim in a circular manner, and is very similar to a rim-flushed clean-water closet. This form was designed to keep the whole of the closet in a clean condition.

This class of closet must, however, be in a building immediately adjoining the room in which the sink is placed, and so close up to the side of the house. The tipler can be placed immediately under the sink in the house, or supported in brickwork immediately outside the house wall. The latter seems to me much the most preferable arrangement. This kind of closet has been styled the "Perfect" slop-water closet, and, indeed, it appears difficult to suggest any improvement in it.

A somewhat similar form of closet to the latter has been arranged by Mr. Dibble, of Birmingham, which also, I am informed, gives great satisfaction. In this closet the tipler discharges on to a grid, through which the water flows before reaching the closet pan. This grid prevents any solid articles being discharged into the pan, but at the same time the force of the flush must be considerably reduced.

Messrs. Whittaker and Co., of Blackburn, construct a closet very similar to the closet first described, the chief difference being that the tipler, though placed close to the closet, is yet in a separate receptacle, and is perhaps in consequence slightly less liable to become foul. Messrs. Oates and Green's closet is somewhat similar, except that the tipler falls backwards, and is claimed by the makers to give a more even flush. Other makers of these closets are Messrs. Clark, Hargreaves, Adams, Stevenson, and Place. The Stevenson closet has a removable disc placed over the trap to intercept large articles. In some of these closets the excreta falls into a pan which contains water, and the opening into the sewer is at the side or back of the closet. In these a special opening to the trap is made behind the closet for the purpose of cleansing, but as this has generally to be some depth below the ground it is not easy to get at.

In Messrs. Day's closet the tipler is placed directly below the seat, and is somewhat larger in anterior and posterior diameter than the pedestal opening, so that all solid matter falls directly into the tipler itself, as well as the slop water; and as the tipler becomes full the contents are discharged directly on to the opening of the trap leading to the sewer (Fig. 4).

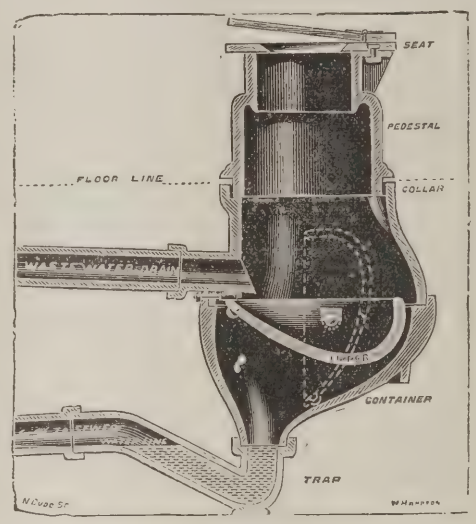

Fig. 4

The next point is to consider the relative advantages and disadvantages of these two types of closet, and the advantages and disadvantages of the slop-water closet itself. The advantages of the slop-water closet may be summed up as follows:—

(1) No extra water supply is necessary, and a head of water is not required.

(2) There is little or no probability of a slop-water closet freezing.

(3) There is less liability of getting out of order than an ordinary water-closet in low-class districts, unless they are hand-flushed by an attendant.

(4) An advantage over the conservancy methods by the absence of soil and surface pollution in and around the closet, and the removal at once of the excreta from the neighbourhood of dwellings.

The disadvantages are:—

(1) The closet is not so clean as a water-closet, the sides being liable to become foul.

(2) A liability to become blocked or broken.

(3) The sewage is fouler.

In discussing these matters it must first be stated that the slop closet can and is only meant for use outside dwelling-houses, and in a separate erection, though this erection may join the house. No opening from one to the other, except for the passage of the slop pipe, or pipe from the tipler, should be permitted.

Where a sufficient water supply can be obtained, I have no hesitation in saying that the clean-water system is far preferable; but in many of the larger towns there is great anxiety over the water supply, and the Authorities are negotiating for increased sources of water, and it is an absolute necessity to husband the present supply and not entertain further sources for its distribution, and a general conversion of privies or pan closets to the clean-water closets could not be entertained. In such towns as these the slop water closets would not be barred for the same reason. I have already spoken of the risk of freezing in outside water-closets, and in slop-water closets there is not this liability. Much of the discharge from sinks, &c., is of a temperature

sufficient not only to prevent freezing, but also to thaw any slight frozen surface which may have occurred during a severe night. In certain districts it is found that ordinary water-closets are constantly being broken, cisterns damaged, and chains pulled off and taken away; and though various articles—stones, bricks, brushes, ashes, &c.—are constantly being put into these closets, on the whole I think there is less liability for slop-water closets to get out of order in such places than clean-water closets.

That the slop-water closet even in its foulest condition has an advantage over the cesspools and privy middens which still exist in several of the finest towns of our kingdom, I think few will deny. As to their preference over a well-conducted pan or tub system that is open to some argument. From investigations I have made, my own experience is that, both in relation to typhoid and epidemic diarrhœa, these diseases are about twice as prevalent in houses supplied with pan closets as in those supplied with slop-water closets, and about twice as prevalent in houses supplied with slop-water closets as in those to which clean-water closets are attached; the slop-water closet being in its relation to these diseases a sort of half-way house between the pan closet and the ordinary water-closet. Though some of these closets do become very foul through want of proper care, in few cases are they equal to the exceedingly foul condition of a similar class of pan closets, and certainly not where ordinary privies or cesspools exist. In places where closets are liable to improper use a regular system of inspection—daily if necessary—ought to be instituted, and the tenants rather than the owners of the houses made to pay for removing blockages which are due to improper materials being put down.

That the sewage of a town in which a large number of waste-water closets exist is fouler than where the town is supplied by clean-water closets is perfectly true, but the question is if this increase of impurity interferes to any great extent with the treatment of the sewage. All towns, if they carry out the duties assigned to them by law, are required to treat their sewage before discharging it into the watercourses. It has been shown that a purely domestic sewage is the easiest to treat, and it is a point open to argument if, where bacterial systems are in use, the addition of excremental material which is loaded with "breaking-down" bacteria to the sink water (much of which is sterile) will not hasten more than impede the resolution of the organic matter in the sewage. In places where the supply of water is very limited waste-water closets would not be advisable, but where a daily flow of fifteen or twenty gallons per head exists they will be found to act satisfactorily. Without recommending any special make as the best, the arrangement of the trap in the Duckett closet has advantages over many others, in that it is directly under the seat, and can be thus easily reached for the purpose of removing any materials causing a blockage. The method of discharge in this make, too, which causes a circular flow round the trap, appears to be an advantage over a direct discharge on to it, while the placing of the tipler in a separate chamber, as is found in Whittaker's make, renders the tipler chamber less liable to be fouled by excrement. In respect to the Day pattern, where the tipler is directly under the seat, it ought, from its construction, to be a much cleaner closet, but it has two great disadvantages. One is the great liability of the tipler being broken by heavy articles being dropped upon it; and the other the frequency of the blockages. These blockages are usually of a trivial character, easily remedied, and largely due to paper, cotton-waste, &c., getting round the pivots on which the tipler works.

In 1899 the total percentage of blockages which occurred in about 2000 closets of various patterns was 16, and the average cost of putting each closet right was 1s. 6d. In 1900 the percentage of blockages was 14, and the average cost of removing the obstructions about the same. If the cost of these obstructions is averaged among the whole number of waste-water closets it amounts to an average of 2½d. for each.

To summarise the conditions under which waste-water closets will be found to act satisfactorily, they must be placed (1) outside the house; (2) in positions where there is, at least, a moderate flow of slop water; (3) they must be properly fixed, and the drainage made perfect in the first instance; (4) there must be a satisfactory scheme for the treatment of the sewage. In districts where householders are careless and dirty, a regular system of inspection should be instituted, and in some of these localities even a daily visit by the Inspector will be necessary to ensure a continuous and satisfactory working.

THE NEED FOR A MINISTRY OF PUBLIC HEALTH.

At a meeting of the Lancashire and Cheshire branch of the Sanitary Inspectors' Association, held in Manchester, Mr. Fred Scott, secretary to the Manchester and Salford Sanitary Association, read a paper on this subject. He urged that a Ministry of Health was in the highest degree necessary. In the Transvaal war, he said, about 7000 men had been killed in action or died of wounds, and almost double that number had died of disease; and in the United Kingdom there were 120,000 preventable deaths every year. Yet we accepted such a state of things as if it were inevitable. The most convincing proof of the inefficiency of our system of health adminstration was the fact that such an enormous death-toll for disobedience to the laws of health was still taken. The public mind was satisfied with the assurances given from time to time of apparent progress as indicated by reduced mortality from certain diseases or success in coping with a threatened epidemic. Yet all the time we were, so to speak, dwelling in a charnel-house, and progress towards that ideal time when a case of zymotic disease in any community would be regarded with almost as much wonder as the reappearance of a specimen of the old British wolf must needs be slow while we regarded the present fearful death-toll as inevitable. It must be admitted that under the present system an excellent organisation for the prevention of disease had been developed, but what was the use of machinery if the hands of those who could and would work it were more or less tied? Mr. Scott indicated several ways in which a Ministry of Health would be of service. For one thing, there would be something like uniformity in the bye-laws of Local Authorities, and Medical Officers and Sanitary Inspectors would be directly responsible to the central authority. A Health Ministry would have a special care for the perfecting of health legislation, and perhaps one of the first things to be done in this direction would be to change the "mays" in Public Health Acts into "shalls." In illustration of the evil results of the present system, Mr. Scott stated that the building bye-laws in Manchester would, if strictly enforced, prevent the erection of any more "jerry" property in the city, yet in some of the suburbs speculative builders were now erecting streets of houses, which in a generation or less must be become slums. In this matter Local Authorities, he submitted, ought to be controlled by a strong central authority.

At the last meeting of the Carlisle Town Council the Baths Committee submitted plans of proposed Turkish baths, which the Council approved and adopted, and authorised an application to the Local Government Board for leave to borrow £1985 to carry them out.

MANCHESTER LADIES' HEALTH SOCIETY.

ANNUAL MEETING.

Last week the annual meeting of the Manchester Ladies' Health Society was held in the Lord Mayor's Parlour at the Town Hall. Mrs. Hardie presided over a numerous attendance.

Mrs. Redford submitted the annual report, which gave a satisfactory account of the work accomplished during the fortieth year of the Society's existence. There were fewer new developments than would have been the case if the funds had not been at so low an ebb. The expenditure had increased and the income had not kept pace with it. Another serious want was that of ladies to superintend the districts. In the South Ancoats division, the inspection of consumption cases became steadily a more considerable part of the health visitors' work. In the Angel-Meadow district lectures on temperance, home life, food, &c., had been given. The number of children sent into the country through the assistance of the children's holiday fund was fourteen, a much smaller number than usual. In the Chorlton-on-Medlock district many insanitary houses had been made habitable, defective roofs had been repaired, and drains and broken flags attended to. Twenty-five children were sent into the country for three weeks through the children's holiday fund. In St. George's district since Easter, two large baths had been put up in Collyhurst recreation room, and there was an average weekly attendance of twenty-five. There were no Corporation baths very near. Seventeen children had been sent away by the holiday fund. In St. Simons, Salford, a beer-house and full-licensed house had been closed. In Silk-street district, forty-five children had received benefit through the country holiday fund.

The balance-sheet showed a balance in hand of £8 12s. 5d.

Dr. Rhodes, in moving the adoption of the report, eulogised the useful work which was being carried on by the Society in spreading a knowledge of the causes of disease, and teaching people the first principle of sanitation. He deplored the prevalence of insanitary dwellings in Manchester, and said he rejoiced that the public were awakening to the injury which was being done to the taxpayer in consequence of the amount of suffering which went on through the insanitary conditions under which the people lived. It was largely in consequence of the slum life of the city that the death-rate of Manchester was so high as to be a disgrace to the city. He mentioned that in Angel Meadow the death-rate was within a decimal of 51 per 1000 of the population, owing to the improper conditions under which they lived. It had been officially reported that the evil was owing to the dirty habits of the people. He did not believe that was so. In Manchester the people were no dirtier than in other towns, yet the death-rate here was enormously larger. The working classes of England were losing £31,000,000 a year through the non-payment of wages during illness, and that any improvement was now becoming noticeable was largely owing to associations such as that.

Archdeacon Wilson, in seconding the motion, remarked that typhus was largely due to dirt, and it was therefore imperative that the people should be taught the importance of sanitary methods.

Mrs. Hardie, commenting on the remarks made, said it was very often the tenants who were to blame for the insanitary state of the houses, and the Society's visitors tried to teach the people how to keep their grids clean. In some neighbourhoods, however, that was a very difficult thing indeed.

The motion was carried.

Miss Burstall, in the course of an address, gave her own impressions of the Society's work, and spoke of the great value of women's work in relation to public health. She could not imagine a sphere of work more fitting for women than that taken up by the Health Society.

The meeting closed with votes of thanks.

National Health Society.

OFFICIAL TRANSACTIONS.

Once again we have to record the success of the National Health Society's diplomées and students in securing public appointments. Miss Hutchinson, who has just been appointed as Health Lecturer at York, received her training under the Society and holds its diploma, while Miss Finola Sullivan, who now holds an appointment as Sanitary Inspector in Dublin (Pembroke Ward), is also a diplomée of the Society. It will be remembered that only last week we chronicled the success of three other of our diplomées, so that it will readily be seen that the Society's training receives marked consideration and appreciation in the selection of candidates for public appointments.

A course of lectures on Anatomy and Physiology by Dr. Squire will be commenced on Tuesday, March 12th, at 53, Berners-street. These lectures form part of the training for the Society's diploma. Further particulars and details will be given at a later date.

On Monday next, March 4th, Dr. Cantlie will give the last lecture of his course on "First Aid" at 53, Berners-street. These lectures have been well attended throughout, and much appreciation has been shown for the individual teaching and attention given by the lecturer to each member of the class.

Lectures at Schools.—One of our lady lecturers is now engaged in giving a course of "First Aid" lectures to the pupils at a large boarding school for ladies at Southbourne-on-Sea. The Society is always glad to receive applications for such lectures, as it is felt that the instruction given must be useful among a number of girls in teaching them to act in an emergency, and in some measure to rely upon themselves.

Elementary Examinations.—We are again receiving numerous applications for these examinations from various counties. Yorkshire, Bedfordshire, and Lincolnshire are all arranging for the examination of a large number of candidates during the next few weeks, while several smaller examinations are also in progress.

The Housing Committee of the Bermondsey Borough Council presented a report last week as to the present position of the Fulford-street and Braddon-street, Rotherhithe, improvement scheme. The estimated net cost of clearing the area, which measures 68,000 square feet, and making new roads and sewers was £29,120, of which the London County Council had agreed to contribute one-half. The number of persons who would be displaced was 550, but plans had been agreed upon with the London County Council and the Local Government Board for the erection of four model block buildings, capable of accommodating upwards of 800 persons. Thirty-nine claims had been settled out of a total of 48, representing a sum of £22,102. Application had already been made to the Local Government Board for the appointment of an arbitrator to deal with the disputed claims, and also with a large piece of vacant land in Braddon-street, of which the owner could not be found. Mr. G. R. Askwith had been appointed arbitrator, and the committee recommended that the hearing take place at the Rotherhithe Town Hall.

MUNICIPAL ELECTRIC LIGHTING.

On Thursday afternoon last the Mayoress of Fulham (Mrs. Cornwall) formally switched on the electric light at the electricity supply works which this enterprising muncipal borough has erected near the end of Wandsworth Bridge.

That the occasion was of something more than local interest was evinced by the presence of invited guests from other municipalities who took a keen interest in the proceedings. More important still, it marked the final triumph of yet one more London municipality in a field of enterprise which has in not a few instances been surrendered to private Corporations without serious pretext.

From the records of the now defunct Fulham Vestry, in possession of Mr. W. J. H. Denselow, the acting Town Clerk of the Borough, it appears that soon after an electric lighting scheme was first contemplated five or six years ago, two private companies made a bold bid for Provisional Orders. The Vestry, however, showed fight and carried the day against their would-be rival, and thus the borough ranks among the sixteen Local Authorities in the County of London which—apart from the powers the London County Council possess in respect of the electric lighting of the Victoria Embankment and Westminster and Waterloo Bridges—are authorised to supply electricity within their own areas.

The Fulham supply works really combine an electrical generating station with a refuse destructor and a disinfector. The destructor, which is of the Horsfall type, consists of twelve cells, room being left for the addition of four others when required, and the heat developed by the burning of the refuse is utilised, so far as it will go, in raising steam in the main boilers. It is estimated that 40,000 tons of refuse will be passed through the destructor yearly, and taking its calorific value as one-twentieth that of good steam coal, this arrangement will save the Borough Council the cost of 2000 tons of coal per annum. Coal, however, will also be needed; the supply is brought up the Thames, on which the station site abuts, lifted from the lighters by a steam crane, weighed in an automatic Ingrey weighing machine, and raised to the bunkers by an electric elevator. The furnaces have Vicars mechanical stokers, and the Babcock and Wilcox water-tube boilers are supplied with water from an artesian well on the premises. The generating plant consists of three sets of two-phase alternators of Swiss design, but made by the General Electric Company at their Manchester works; each is of 300 kilowatt capacity at from 2800 to 3000 volts, and is driven by a horizontal compound condensing engine of the low-speed Corliss type, made by Messrs. J. Musgrave and Sons, of Bolton. The speed of the alternators is 93·7 revolutions a minute, and the frequency is 50 a second. There are also three continuous-current dynamos by the same makers for exciting and other purposes, each coupled directly to a Musgrave enclosed high-speed engine, and three Ferranti rectifiers for use in connection with the public supply circuits. Of the cables, which were made by the British Insulated Wire Company, some thirty-six miles are already in place, and earthenware ducts have been laid for forty-eight miles. The high-pressure current yielded by the main alternators is transformed down at five sub-stations, and the public receive their supply at 200 volts, both a single-phase and double-phase current being available for motors. The charge is to be 5d. per unit for lighting, and 2½d. per unit for power, no charge being made for meter rent. No "free-wiring" contracts have been entered into, but it is satisfactory that applications equal to about 10,000 eight-candle power lamps, or one-third of the total capacity, have already been received. It is also satisfactory that the various contracts were entrusted to British firms, and the work was carried out by British labour.

LINCOLN CITY SURVEYOR ON SANITATION.

At Lincoln Church House Mr. R. A. MacBrair, A.M. Inst. C.E., Mem. San. Inst., Lincoln City Surveyor, gave a lecture on "Some Dangers to Health; Points in Sanitation." The lecturer referred at length to the composition of air, and gave figures showing the evil results of non-ventilation and of improper ventilation. He specially condemned the various—now, fortunately, old-fashioned—systems of down draughts, and by means of special diagrams showed such systems to be much worse than useless. Boyle's system he considered as good as any possible. Slides were then thrown on the screen illustrating how defective drainage is injurious, and how such defects are not only quite avoidable, but how that the systems which are without these defects are just as simple to lay as any other. Then, after a description of disease germs, and the way they increase and spread, Mr. MacBrair went on to explain how their propagation may be checked and the germs themselves destroyed by means of chemicals and various other disinfecting processes. The great sanitary question of all municipalities was, of course, the disposal of the town's sewage. Various methods have been tried in America, where there were very large, fast moving rivers. The sewage was dumped into them, and soon oxidised without at any time being a danger to health. But in the inland towns of England this method was not possible, and other ways had to be adopted. The best known was the treatment of the sewage by chemicals and its conversion into a fertilising agent, but the best and latest treatment was by means of a septic tank, in which the germs, instead of being destroyed, were cultivated and set to neutralise one another, the cultivation of the germs being carried out on a coke lining to the bacteria beds. In Lincoln the sewage system had been of inestimable benefit to the inhabitants, the death-rate having been reduced from 25 per 1000 in 1848 to 14 per 1000 in 1900, this, for the present population, being a saving of 500 lives per year. Sub-Dean Leeke, in proposing a vote of thanks, said this was a most important subject, and one that should be taken up by everyone if only for the sake of strengthening the hands of the Council in their efforts to make the city as healthy as possible.

Mr. M. H. Footman, Chairman of the Sanitary Committee, seconded the resolution, and referred to the Corporation farm at Washingborough, which, according to the report of the Local Government Board Inspector, was as good as any in the country, Mr. MacBrair being one of the pioneers of the bacteria bed system. He also said that a sixpenny rate had been spent during the past year on the farm, and as much would be spent this year, but then Lincoln would be as fully equipped for the disposal of sewage as any place. It was really a matter worth doing, since improved sanitation has, according to the insurance actuaries, increased the prospect of life by 1½ years in the case of men and 2¾ years in that of women, and each life is of the value of £157 per year to the State.

The Maldon Town Council and Rural District Council have combined for the purpose of erecting and maintaining an isolation hospital, and an inquiry was held by Mr. W. W. E. Fletcher, M.B., last week into an application for the formation of a Joint Hospital Board. The cost of the proposed building is put down at about £6000.

Sanitary Inspectors' Associations.

NATIONAL UNION.

A QUARTERLY meeting of the National Union of Sanitary Inspectors was held at Oswestry on Saturday, 23rd inst. There was a good attendance of members, including Messrs. W. Bland, chairman of Union; N. Coates, hon. treasurer; A. Jno. Hughes, hon. secretary, North Wales District Centre; J. T. Quinton, hon. secretary, North-Western Centre; H. H. Spears, hon. secretary of Union; and representatives from Liverpool, Manchester, Birmingham, St. Helens, Bolton, West Bromwich, Stafford, Wednesbury, Rhyl, Higher Bebington, Lower Bebington, Wrexham Rural, Oswestry, Oswestry Rural, Denbigh, Connah's Quay, Formby, Bangor, &c.

The party assembled in the Council Chamber, Guild Hall, Oswestry, where the official reception took place. The Mayor (A. T. Daniel, J.P.), who wore his chain of office, was supported by Dr. Aylmer Lewis, chairman of the Sanitary Committee; a large number of the members of the Corporation; Mr. J. Parry Jones, Town Clerk; Dr. Beresford Hope, Medical Officer of Health; and Mr. G. W. Lacey, Borough Engineer, and others.

The MAYOR tendered a cordial welcome on behalf of the borough, and expressed his hope that the visit of the National Union to Oswestry would prove to be both interesting and instructive. The town they were visiting was not one of mushroom growth, as their charter of incorporation was 503 years old, but nevertheless they prided themselves on the fact that they were thoroughly up to date in sanitary matters. He would ask the chairman of the Sanitary Committee, Dr. Lewis, to give them a short description of the special work they had undertaken as regarded the bacterial disposal of the sewage.

Dr. AYLMER LEWIS said that he personally was very pleased to support their Mayor in his welcome to the delegates. They had many visitors at their bacterial works—Engineers, Medical Officers of Health, members of Councils, and sanitarians generally—and all who had hitherto visited the district had gone away satisfied that the Oswestry Corporation were on the right track. The disposal of sewage had been a most serious question for them to deal with at Oswestry. Expert advice had been taken, and they were informed that an expenditure of from £20,000 to £30,000 would be necessary. Their late engineer, Mr. Wynne Roberts, now of Capetown, went into the matter, and as a result they constructed out of revenue some bacterial beds which were working in a most satisfactory fashion.

Dr. BERESFORD HOPE, Medical Officer of Health, also spoke, and claimed that he was one of the oldest Medical Officers of Health in the country, he having been in office for something like thirty-four years. In the course of a most racy speech he alluded to the steps that had been taken to purify the air and subsoil of Oswestry. He held that Sanitary Inspectors and elementary teachers were the two most useful professions in the country.

Mr. W. BLAND, chairman of Council, acknowledged the cordiality of the reception, and moved a vote of thanks to the Mayor and Corporation, which was enthusiastically adopted.

The quarterly meeting was then held, the routine business including the election of the following new members:—Messrs. J. L. Clarke and A. Williamson, Liverpool; A. E. Chertham, Manchester; C. R. Billingham, John Franklin, and Fred. Sowerbutts, Stockport; O. H. Williams and R. Holden, Blackburn; R. W. Marshall, Fenton; and J. H. Pearson, Broadstairs, Kent.

Mr. Thomas Morrell, Darlaston, was also elected as an Associate Member.

The CHAIRMAN then called upon Mr. G. W. Lacey, C.E., Borough Engineer and Surveyor, to read his promised paper on "Oswestry Bacterial Sewage Disposal Works and Sanitation."

Mr. LACEY pointed out that the population of the district was about 10,000, and was increasing at a fairly rapid rate. The town was sewered practically throughout, and water-closets were general throughout the town. The water supply, which came from the Welsh hills, was very good. After describing the history of the well-known bacteria beds, which he said had cost about £2000, the average cost of maintenance being about £220 per annum, he said the average purification effected was as follows:—Albuminoid ammonia, 80·5 per cent.; and oxygen absorbed, 88·4 per cent. Their vital statistics were also very satisfactory Their death-rate for 1900 was 16·0, the zymotic rate being 0·41. It appeared that with the exception of Newport, they were the healthiest town in the county of Salop. Eight cases only of diphtheria and typhoid had been reported during the two years 1899 and 1900, and in 1900 only one death had occurred from typhoid, and none from diphtheria. All the ashpits had been abolished, and for the last four years there had been a daily collection of house refuse.

A discussion on the paper was opened by the CHAIRMAN, who was followed by Messrs. A. JOHN HUGHES, W. WOODWARD, H. EDWARDS, N. COATES, J. T. QUINTON, JOHN EVANS, and the HON. SECRETARY, a hearty vote of thanks being passed to Mr. Lacey at the close.

Mr. LACEY thanked the members for the vote of thanks, and briefly replied to the various questions raised.

The party then proceeded to the sewage works by brakes, where a demonstration was given by Mr. Lacey.

At the conclusion of the inspection the party were driven to the Queen's Hotel, where tea had been provided by the hospitality of the Mayor and Corporation, the function terminating a most successful meeting.

CORRESPONDENCE.

(*To the Editor of* THE SANITARY RECORD.)

(*We do not in any way hold ourselves responsible for opinions expressed by our correspondents.*)

WHAT CONSTITUTES A SANITARY INSPECTOR?

SIR,—I should like to know through the medium of your paper if any man acting as Sanitary Inspector for a district can describe himself or use the title Sanitary Inspector without obtaining some sanitary certificate. I think it is very unfair if such be the case, when we find men appointed without any certificate whatever. It is fully time the sanitary body sent a Bill to Parliament for Guardians and boroughs that nothing but qualified men be appointed. Now, I will give you an instance. I live in a rural district consisting of twenty-six parishes. The Sanitary Inspector (uncertificated) was a Guardian of his board previous to appointment, and brought up as a farmer. He simply resigned his position as Guardian, and was appointed Sanitary Inspector. He does not live in one of his inspecting parishes. He is an auctioneer and valuer, and has no mode of conveyance. He receives a salary of over £40 per annum. It looks hard for men who have studied and spent money, and who have to fight against such.—

Yours faithfully,
ASSOC. SAN. INST.

February 23rd.

BOTH the Millom and Bootle Rural Councils have announced that unless certain stipulated conditions are accepted they will offer all possible opposition to the Barrow water scheme.

MUNICIPAL ENGINEERING & SURVEYING.

CROSS-TABLE CHAT.

I observe that an American has invented a machine which it is claimed will supersede snow ploughs and the like for clearing away snow. This apparatus is described as a furnace on wheels, fed by petroleum and supplied with an iron fan-shaped shield which projects in front of a series of burners a few inches above the roadway, the snow on which is rapidly dissolved by the heat radiated downwards by the shield. A set of rotary brushes sweeps the melted snow into the gutters and leaves the street perfectly clean.

It is interesting to observe that the Corporations both of Leeds and Manchester have been simultaneously carrying on experiments to test the practicability of the purification of sewage by bacterial methods, and that in each instance they are satisfied as to the efficiency of the method. It appears that in each case septic tanks were considered necessary adjuncts to aid in liquefying the solids in the sewage prior to its being run on the contact beds. Continuous filtration by sprinklers has not been found successful, which confirms the opinions I formerly expressed in this column, and which have been combated by one or two correspondents. Open septic tanks, it is asserted, give equally as good results as closed ones, and at the most it is not expected that such tanks will require emptying more than once a year. The sewage of Leeds is an exceptionally difficult one to treat bacterially, owing to the excessive amount of iron present in it—indicative of its industries—amounting to as much, I believe, as four tons per day. This material silts up the coarse beds hitherto used, and it is hoped to obtain a material which will not be affected to the same extent as the clinker which has been previously utilised for such beds. These difficulties only serve to show how that dogmatising in the domain of sewage treatment is impracticable and foolish, owing to the varying character of the sewage of different towns. Such difficulties can, however, be overcome, especially when the subject is tackled in such a thoroughgoing scientific manner as that followed at Leeds under the able chairmanship of Alderman Harding—who is by profession a civil engineer—in conjunction with Mr. Hewson, the borough engineer, and who are also assisted by eminent chemists.

Adaptability of conditions as regards sewage treatment to inland towns is very necessary, but it does not agree with the practice of the Local Government Board, who appear to attempt to enforce one system—land treatment—under all circumstances. Possibly the Board will learn wisdom by-and-bye. I should add that the experiments referred to, and others which I could name, have shown that bacteria beds constructed to a depth of 10ft. and 12ft. give excellent results as regards purification.

The bye-laws of Local Authorities with regard to new buildings, as is well known to surveyors, prohibit any timber or woodwork being placed within 15in. from the upper surface of the hearth of any chimney, and in order to meet this requirement it is a general practice to construct such hearths in concrete, a segmental arch being turned from the trimmer joist to the wall. In order to facilitate this mode of construction, and to ensure thoroughly sound work, I would advise my readers to acquaint themselves with Moore's Steel Hearth "Bridge" boxing, which is made, as its name implies, of steel $\frac{1}{8}$in. thick, and of varying spans and width on which to carry the concrete without fixing any centering. The steel plate, which is convex in form, has a flange on one side which rests on the chimney breast, and on the other side is a flange for bolting to the trimmer joist. It is readily fixed, extremely effective, and reasonable in price. Messrs. Statham and Sons, contractors' merchants, are the sole agents for the manufacturers, viz., Davies Brothers, Abenbury Works, near Ruabon.

I have often been at a loss to understand why Rural District Councils neglect so greatly to protect their districts against fire by failing to organise and maintain fire brigades. This neglect is unfair to the ratepayers of their district, for in the event of a fire occurring on their premises the cost of the fire brigade from a neighbouring urban district has to be paid by the owner of the premises damaged, who has already by the fire suffered sufficient loss. Such ratepayers are in a much worse position than those dwelling in an urban district, for the latter cannot be called upon to pay the costs of attendance of their own brigade.

A Rural District Council is enabled to obtain urban powers under Section 171 of the Public Health Act, 1875 [which incorporates the provisions of the Towns Police Clauses Act, 1847 (Sections 32 and 33) relating to the provision of fire engines and firemen] and no better example of the successful application of these powers can be found than that afforded by the Sunderland Rural District Council. It appears from the excellent annual report of the brigade compiled by Mr. J. C. Wilson, the energetic secretary to the brigade department—and who is also deputy Clerk to the Council—that in all the parishes, save one, a paid and regularly-drilled brigade, under a superintendent and deputy-superintendent, with a well-equipped fire station and manual engine, now exists. An admirable set of rules is in force containing instructions for drill; particulars as to the exact locality of each hydrant; instructions as to attendance at fires, &c. Effective means for summoning each member in the event of an outbreak is in force, and generally the organisation of the brigade system throughout the district, under the able control of Mr. Wilson, is about as efficient as any I have come across. I commend the perusal of Mr. Wilson's report to the officials and members of Rural District Councils, in the hope that it may stimulate other Councils to emulate their example.

Writing of fire protection for villages, I have frequently observed that some villages which are dependent entirely upon wells for their domestic water supply suffer most seriously in an outbreak of fire from the inability of a brigade—when it does attend—to secure a sufficient supply of water from which to pump. Such a difficulty may very frequently be overcome, in many instances which I have come across, by the construction of an artificial pond across a small watercourse at any point within a quarter of a mile of the village, and all villages dependent upon their water supply from wells should make and maintain such an artificial pond if practicable. Where, however, no such stream of fresh water is available, then the effluent from the village sewage works, or, as a last alternative, sewage which has been partially freed from solid matter by straining or rough screening, may in an exigency be utilised. By the formation of responsible and well-organised parish fire brigades only will proper measures, such as those indicated, be taken to prevent that serious destruction and loss to property in rural districts which is so frequently chronicled, and which might, with a little forethought and provision, have been avoided. Senex.

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The Sanitary Record

AND

Journal of Sanitary and Municipal Engineering.

FEBRUARY 28, 1901.

THE SMALL-POX EPIDEMIC IN SCOTLAND.

THE epidemic of small-pox in Scotland continues to spread over an ever-increasing area, and the disease has now made its appearance in a number of places that were previously exempt. There is hardly one of the larger towns in Scotland where cases have not occurred. But in Glasgow, the principal seat of the epidemic, and to which its ramifications elsewhere are almost all traceable, the reports are more favourable, indicating that the outbreak is steadily on the decline. At a meeting of the Town Council last week the convener of the Health Committee reported the number of cases then in hospital to be 387—a considerable decrease on previous reports, and the number has since then been still further largely reduced. It was also mentioned that the percentage of deaths was 3·52 in the case of vaccinated persons, and 46·30 in the case of persons who had not been vaccinated—a statistical result which should carry conviction with anti-vaccinators. Re-vaccination has been largely taken advantage of in Glasgow, 240,000 adult persons having undergone the operation, but as the total adult population is 560,000, it will be seen that more than half the population have still failed to respond to the appeal of the Corporation.

In Leith an excellent report on the subject has been made by Dr. W. Leslie Mackenzie, who, after his resignation of his position as Medical Officer of Health, continued to supervise the work of the department until the date of his successor's entering on office. He emphasises the importance of early isolation, and says that to the educated care and vigilance of the profession, and to the rapidity of action whenever a case was discovered, they owe the fact that, although during the six years of his tenure of the Medical Officership small-pox had been imported into the burgh on sixteen separate occasions, infecting twenty-three houses, yet in no single instance had it broken bounds, or spread beyond the house in which it was in each instance discovered. He did not well see how this record could be improved upon. The system he had followed, he proceeds, had been very simple, but very thorough; immediate isolation, immediate disinfection, and vaccination of immediate contacts, relentless daily and hourly pursuit of possible contacts, daily supervision at home or in hospital for fully a fortnight, and during that fortnight he had spared neither man nor beast. He had blotted out the distinction between day and night, and the reward had always been a clean bill at the end. In these words we have the administrative ideal to work up to. So far as the individual is concerned, we cannot do better than quote the words of Dr. Matthew Hay, of Aberdeen, that "it is necessary to impress on the public mind that the one proved preventive of small-pox is vaccination, followed by re-vaccination if the person is above ten to twelve years of age. There is no fact in the whole region of preventive medicine which stands upon a surer basis than the preventive effect of vaccination upon small-pox."

The Value of Veterinary Inspections.

AN interesting decision has been pronounced by Sheriff Orphsot, of Edinburgh, which illustrates the value that is to be placed on veterinary inspections of cattle at public sales. A cattle dealer was charged under the Public Health Act of 1897 with having been the owner of a cow which was deposited in the sale-yard of Messrs. Oliver and Sons, Edin-

burgh, for the purpose of sale, and which was then unsound and unfit for food. The evidence showed quite clearly that the animal was suffering from tuberculosis, and after slaughter the organs were found to be affected with tuberculosis to a large extent. But the defence put forward was justifiable ignorance, and reliance on a Veterinary Inspector's examination. The accused said he had bought the cow the previous day at Messrs. Oliver's public sale at Hawick, where all the animals were previous to sale inspected by a Veterinary Inspector; and the veterinary surgeon corroborated this, stating that he had observed nothing wrong with the cow. The Sheriff was satisfied that the accused did not in point of fact know the condition of the cow; but the real question was whether he could not have known by the exercise of reasonable care. In making the purchase he relied upon the fact, known in the trade, that the animals exhibited in Messrs. Oliver's yard for sale were, previous to sale, examined by a veterinary surgeon, and he consequently took it for granted that none but sound animals would be sold. But considering that on the occasion in question the surgeon had examined thirty cows and about 200 sheep, the examination must have been of a somewhat general character; there was no special examination of any particular animal. The question then came to be whether a purchaser was, from the point of view of the Public Health Act, entitled to rely on such an examination by the veterinary surgeon. To decide that question in the affirmative, the Sheriff said, would open the door for the introduction of animals which might pass the veterinary surgeon's examination in the sale-yard, but which might yet be, as that cow was, in a condition dangerous to the public health. He could not, therefore, accept the reliance on that examination as taking the place of the reasonable care required by the Act of Parliament, and must accordingly convict. The decision is an important one, and from the point of view of the public health, quite unimpeachable.

Phthisis in Schools.

The Secretary of the Board of Education, in reply to a query from the Kingston-on-Thames School Attendance Committee inquiring how they are to act in the case of children with a tendency to consumption failing to attend school, and whether special classes should be established for consumptive children, writes:—"I am directed to state that the Board of Education are advised that a tendency to consumption is in itself no bar to attendance at school. But a child suffering from actually developed phthisis ought to stay away, as fit only for medical treatment, and as infectious and dangerous to other scholars. In doubtful cases, where no medical certificate is forthcoming from the home, your committee should take steps to obtain one." This attitude seems reasonable enough. But it is to be hoped that the education of consumptive children will never be insisted on to the extent of providing special classes for their benefit. The preservation of human life is even more important than education, and the hygienic conditions of crowded schoolrooms are not likely to eradicate the disease. When the danger to others is considered, there can be no question that the proper place for a consumptive child is at home, and not at a public school. Those with a tendency that way are better in the open air. There is no object to be gained in educating a child and sacrificing its life in the process.

London's Latest Scheme.

At the meeting of the London County Council on Tuesday the Housing Committee gave some particulars of the great scheme which, we were told, had been for some time in preparation. The site selected is at Tottenham, and would appear to be well served on one side of the estate with train and tram communication direct to the heart of the City. There are stations on the southern side from which the Council hope to secure the running of workmen's trains at nominal rates. The area of the ground proposed to be secured is about 225 acres, and upon this the Committee estimate that 5779 cottages may be erected, capable of housing 42,500 persons. At present, however, only a portion is to be developed, upon which accommodation for 33,000 persons will be provided in 4750 self-contained two-storey cottages, and 2000 more will be provided for in tenements over shops. The cottages will be of various classes, and each cottage will have its own garden. The number of persons to be placed on the site will not crowd the land unduly. The depths of the various cottage plots will be generally greater than the bye-laws of the Local Authorities require, and forecourts will in all cases be provided. The frontages to the main roads are very suitable for shops, and about 10½ acres of land will be given up to this purpose, upon which about 250 shops will be erected, and from these a considerable income could probably be obtained should the Council decide itself to build the shops. It will be necessary to widen Lordship-lane for the construction of the proposed tramway, and the shop plots have been made of sufficient depth to allow of this being done. Open spaces will be left for public gardens and playgrounds. Many other interesting details were given, and finally the Committee reported that the estimated cost would be £1,530,858. This is based upon the idea that no charge shall be imposed upon the rates. The Committee deem this a "harsh" condition, but we cannot agree with them. That the cost of the land should be spread over a longer period than that of the buildings is a just contention, and will be endorsed by every thoughtful person, but we do not see in the refusal of the Government to grant this division of expenditure any reason for charging one class of ratepayers for housing another. If the working classes have been able to struggle against the extortionate rents of jerry builders and "grasping landlords," surely they will gladly pay the lower charges which a municipality can let at sooner than make themselves a burden to others. The middle classes of this

country are fully prepared to bear their share of the legitimate cost of government, and that is heavy enough, without imposing fancy charges upon them to satisfy the clamour of a few theorists, who ever shirk any practical exemplification of their pet scheme.

An Optimistic Report.

There is an interesting paragraph in the annual report of Dr. Samuel Kirby, Medical Officer of the Hoxne rural district in East Anglia. So much has been written on the distressful condition of the labouring classes in this part of the country, that it is quite cheering to come across something of a brighter nature. Dr. Kirby is of opinion that labourers' dwelling-houses in his district are slowly but surely being improved. "Four old houses have been pulled down, but much yet remains to be done; at present the supply exceeds the demand, and the would-be tenant has a chance of choosing the better cottage as a residence. There are many old cottages in the district which are untenanted, unsightly, and dilapidated, and which before they could be inhabited would have to be put into a proper state of repair—a course expensive and perhaps unsatisfactory. Undergoing as we are a process of depopulation, we cannot expect to see many new cottages erected, the space accommodation must be sufficient, or we should have more cases of overcrowding. The general condition of the agricultural labourer has very much improved during the last few years, and, in a great number of cases where this is not apparent, the cause lies with the person who should be benefited. Whether the light railway, which is intended to run through part of the district, will, when completed, add to the welfare of the district remains to be seen." Better homes, improved conditions, and light railways, may yet make for the salvation of the East Anglian labourer.

Salaries of M.O.H.'s.

It would be well for Medical Officers of Health as a body were all mayors as equally far-seeing and liberally-minded as Alderman Stillings, the Mayor of Pudsey. At a recent meeting of the Pudsey Town Council the question of the Medical Officer's salary came up for discussion in his reappointment, and a proposal was made to increase the stipend £100 per annum. In supporting this step the Mayor said:—"Clearly it was their policy to secure and to maintain throughout the borough a 'clean bill of health' and the best sanitary conditions, so as to encourage building operations for both dwellings and business purposes, which would be followed by an influx of new residents, and, as a necessary consequence, would increase the rateable value. This was no mere dream. It was the goal at which they had to aim, and they must make their plans with prudence, forethought, and courage to accomplish this end. In his (the Mayor's) judgment the Medical Officer would play a very important part, and he was persuaded that the wisest course for the Council would be to place that functionary in a strong position. He ought to be upheld in every useful health reform he brought forward; he ought to be encouraged to suggest reforms; he ought to be placed in such an independent position that he could feel free to inaugurate any reform and correct any evil without being subject to the risk of personal anxiety of dismissal from service. He should not be a mere chronicler of disease and insanitary conditions, but he should feel that he had the Council at his back in his efforts to sweep away without fear or favour anything and everything prejudicial to the public health. Therefore, in his opinion, they should pay something like an adequate salary for the responsible position which he held." Unfortunately the opinion of the Council was not unanimous, the resolution only being carried by nine votes to eight; but, all the same, the Medical Officer has the satisfaction of getting the increase. If the point of view put forward so admirably by Alderman Stillings was generally taken to heart, Medical Officers of Health would be placed in a much more satisfactory position than they are at present. But it is well to know that the representatives of the positions are gradually being better appreciated, and they are bound to be more so as education and enlightenment increase and the status of public bodies is raised.

Prejudice still to be Overcome.

When the Borough Councils came into existence in the metropolis we hoped that many of the old prejudices and narrow practices would pass away with the old Vestries. But it would appear that in Lambeth, at any rate, there still lurks an objection to the employment of women as Sanitary Inspectors. Last week the Council received a recommendation from its Officers Committee to the effect that instead of "increasing the annual increments of the Sanitary Inspectors in consequence of extra services, we recommend the appointment of a female Sanitary Inspector to relieve them of the pressure of these extra services by taking some of their other duties." The recommendation had been referred to the Medical Officer of Health, who reported strongly for the lady. He pointed out that in Lambeth there had been registered 740 workshops, with 1303 workrooms, wherein 4324 were employed. Of these, 2539 were women and girls, who certainly would be better looked after by a female Inspector. In addition, there were many shops wherein women and girls alone were employed. Women and girls were more likely to talk to and confide in female than male Inspectors. Moreover, a female could inspect infants' and girls' schools, visit the houses of the poor, visit tenement houses or houses let out in lodgings, and work amongst the poor and assist in advising mothers as to the caring for and feeding of infants, and as to domestic sanitation generally. With such weight given to the Committee's proposal, we should have thought that it would have been carried unanimously, but several of the members fought against it, as if the introduction of a woman

Inspector was an outrage upon the community. Perhaps there was something more than prejudice behind their action. Do they fear that a woman will find out "too much"? Eventually the recommendation was carried, but action was deferred for six months. Such a "wobbling" Council is not likely to inspire much confidence.

Fighting Plague in India.

According to the *Bombay Gazette*, a somewhat novel experiment was recently tried in Bhownager, with the object of freeing the town from some of the diseases which prevail at intervals with disastrous results. One of the chief objects in view was to diminish plague, and to this end, between six and seven o'clock, every street, lane, or alley, was thoroughly fumigated with damar or sulphur. The whole town was enveloped in smoke and presented a strange appearance under the pale light of the moon. This process of simultaneous fumigation was continued for five days. It began on the 15th ult., all the houses doors, and floors being washed with well-known disinfecting solutions. All drains had been disinfected and cleansed in the same manner, and tons of dust and filth, the accumulations of years, were removed. The Darbari officials, with the aid of well-known and energetic citizens, were appointed by the Mahajab in each ward to superintend this work, and all citizens are deserving of the highest praise for their co-operation. It is fervently hoped that by these measures the health of the town will be considerably improved, and that plague and other kinds of dangerous disease may be materially lessened, if not entirely suppressed. The most noticeable fact in these operations has been the total absence of apathy or prejudice on the part of the people, and this no doubt is owing partly to personal influence of the Mahajab, and to moderation and conciliatory attitude of gentlemen in charge of operations towards the people. This latter fact marks a great improvement, for nothing has stayed the advance of health reform in India so much as the blind prejudice of the natives to anything contrary to their innate desire to be left alone in their filth and degradation.

Nursing Institutes.

One of the best features of the closing years of last century was the establishment of nursing associations in all parts of the country. The benefit they confer upon the community, and especially to the poorer members, is immeasurable, and not only do they help to prevent unnecessary suffering, but they have done much to rescue the poor from the coils of the "wise women" who have lived so long upon the credulity of their victims. Some idea of the work done may be gathered from the report presented at the annual meeting of the Birmingham District Nursing Society, which was held last week. In the year 1900 over 2500 cases were attended, and these received over 57,400 visits. In six years the operations have doubled, and yet the Committee feel they have scarcely touched the fringe of the work that should be done. Speaking at this meeting, the Lord Mayor of Birmingham urged that two or three manufacturers should combine to support a nurse for the benefit of their workpeople. That, he thought, was a very excellent thing to bring home to the Birmingham manufacturers. There were very few firms now-a-days that had not been converted into limited liability companies, but he did not see why such a work might not appeal to a board of directors equally as to a private manufacturer. It seemed to him so sensible and practical a thing that it should be done generally throughout the city. If two or three manufacturers could not afford to support a nurse, half a dozen, perhaps, in a district might combine to do so for the benefit of their workpeople, or perhaps something might be done through the sick societies that existed in connection with most large works. He could not endorse the view that manufacturers in Birmingham failed to recognise the benefit of health to their workpeople, because very many of the large manufacturers did give a good deal of attention to such matters as the sanitary condition of their establishments. We commend this suggestion to the great merchants of other towns. We know of no branch of philanthropic and social work in which so much real good is done at a small cost, as by nursing institutes, either in the town or rural districts.

Sanitary Officers at the Front.

A correspondent of the *Morning Post* has forwarded to that paper an extract from Lord Wolseley's "Soldier's Pocket-book for Field Service," which comes down very heavily upon the "Sanitary Officer in the field." The quotation tells us that the "Sanitary Officer is a creation of recent years, and as a general rule he is a very useless functionary. In the numerous campaigns where I have served with a Sanitary Officer I can conscientiously state I have never known him make any useful suggestion, whereas I have known him make many silly ones. It is not his fault, for with an army moving it is impossible to drain a town, as I have known suggested, or carry out any other great sanitary measure. There is not time for any great sanitary works, and for the ordinary cleanliness of temporary camps or bivouacs the P.M.O. (Principal Medical Officer) with each division can do all that is necessary. In future, as long as this fad continues, my recommendation is to leave him at the base, where he may find some useful occupation as a member of the Sanitary Board, which I think should have charge of all sanitary arrangements at the base." We presume that the sender of this extract thinks that it entirely discredits the contention of Sir Walter Foster and others that a properly-qualified sanitary expert should have accompanied our army to South Africa. But we do not think it does anything of the kind. We grant that Lord Wolseley has had considerable experience in active service, but neither he nor any other living general, has ever taken part in such a war as that which is at present going on in South Africa. It

may be perfectly true that when fighting is going on the sanitary expert is not required; but fighting has occupied but little time in this war, and where bullets have slain their hundreds, disease—and that preventable disease—has slain its thousands. It is on the camping grounds that the sanitary expert should have been in evidence, and by his advice, and better knowledge and quicker perception of dangerous surroundings and conditions, he might have saved many of the precious lives which have been so ruthlessly sacrificed. Every war is different, and provision should be made for every emergency. Better to have even a "faddist" with the army than lose soldiers from enteric fever by the thousand.

Queensland's New Health Commissioner.

The papers to hand from Brisbane announce the arrival in that city of Dr. B. B. Ham, who has been appointed Health Commissioner for the Colony. The irrepressible interviewer met him and tried to gather some idea as to the work Dr. Ham intends to initiate and carry out. He confessed that he was greatly impressed with the vastness of the Colony, and Brisbane itself was a much more extensive and go-ahead place than he had imagined. But Dr. Ham made it clear that he did not propose to slavishly follow the lines laid down in the British Public Health Acts. He fully realises that he has a new country to deal with, that instead of having to break through prejudices made strong by generations of bad practice and ignorance, he can commence at the very beginning and build up the nation on true hygienic principles. Thus he believes it possible to educate the people up to such a standard in regard to sanitation that they will understand and appreciate Queensland's new Health Act, which contains many provisions and terms new to the laws of the Colony. "This education," said Dr. Ham, "must tend to make a man more careful of the water he drinks, the food he eats and the air he breathes, the soil he treads on, and the house he lives in," and by this means a factor will be created which will make the sanitary administrative machinery easy in its working. We have always maintained that sanitary science knows no political party, nor is it the monopoly of any sectarian creed It is the handmaid of all true religion, and the health officer is, in the words of the present French Prime Minister, the most valuable and indispensable *collaborateur* of all or any Government. It is in this spirit that Dr. Ham is entering upon his new duties, and he has gone out armed with every appliance and method he could gather together to help in fulfilling the high ideal he has set before him. That he does not anticipate all will be smooth sailing is indicated by the closing reply to his interviewer. "I understand," he said, "that there have grown up in this Colony large industries whereby the source of public revenue has been considerably increased. And should I, in the course of my public duties, have to deal with vested rights and properties, I shall do so with careful consideration, mindful of the interests involved; but where I find danger to the public health, or gross insanitary conditions, I shall take no half-hearted measures, form no halting decision as to the means to be adopted to have these defects remedied. Pure air, pure water, pure food, pure dwellings, are texts as old as the doctrines of Moses; and yet they are the watchword of the sanitarian of to-day."

REVIEWS.

The Sanitary Inspector's Field Book, for Use in Rural Districts. Compiled by H. G. Keywood. Maldon: Richard Poole. Price, 2s. 1900.

The object of this note-book is to reduce to a minimum the inconvenience of taking notes during rain. For this purpose a number of headings are given, and these the Inspector ticks off if they apply to the premises inspected. The idea is a good one, but the book would perhaps be the better for some simplification. Indeed, so many useful additions might be made that it is a question whether or not the old style note-book is, after all, to be preferred. The note-book is applicable, the author states, to both cottage and mansion, but surely the Inspector will wish to know something more of the drainage arrangements of the latter than the items comprised in the book, namely, "gully," "sink waste," "pipes," and "where to." Then, again, "good," "bad," and "medium" may mean anything or nothing. Altogether, it appears to us the book is conducive to a superficiality of inspection which is not at all desirable, and which, in the interests of the public health, we trust is not frequent.

Public Works.

SEWERAGE.

Rochdale has obtained sanction to a loan of £8000 for the reconstruction of the workhouse drainage.

At a recent meeting of the Maxwelltown Town Council it was resolved to proceed with Mr. Carter's scheme of sewage disposal, at a cost of £14,000, subject to some modifications.

Mr. A. H. Wyrill, Borough Engineer, recently reported to the Swansea Water Committee on the proposed cost of the Brynmill sewer outlet and septic tank schemes. The total estimate was £57,200. There was an alternative scheme estimated to cost £80,000.

Last week at a special meeting of the Rotherham Town Council, the Mayor (Mr. G. Gummer, J.P.) presided, and moved the following resolution, which was agreed upon:—"That the Corporate Seal of the Corporation be affixed to a mortgage to the Public Works Loan Commissioners for £45,775 for sewage works purposes; also to an authority to the secretary of the Commissioners to deliver the certificate for £20,000, part of the said sum, to the Sheffield and Rotherham Joint Stock Banking Company."

The Atcham Authorities, through their Surveyor, Mr. J. Morris, have been making inquiry into the various methods of sewage disposal, with a view to the adoption of a scheme, and after visiting a number of sewage purification works, Mr. Morris reports that he considers the best systems are those in operation at Reigate and Oswestry. He gives the preference to Reigate for its greater simplicity, it being an oxidising bacterial system combining Candy automatic sprinklers and intermitters upon polarite beds.

The Eastry Rural District Council has, after considerable discussion, resolved to apply to the Local Government Board for a loan not exceeding £2000 for alterations in the sewage disposal works, in accordance with the plan, specification, and estimate prepared by Mr. Anson.

The Lanchester Rural District Council has declined to join the Durham Council in regard to the disposal of the Ushaw Moor drainage, because its share would amount to between £1200 and £1300, whereas the Council estimates that it could carry out the work affecting its own area for £400. The Local Government Board has written the Rural District Council, stating that it would be advisable that there should be combination between the Durham Council and the Lanchester Rural District Council for the treatment and disposal of the sewage of the whole of Ushaw Moor at one outfall rather than that independent outfall works should be provided for each part of the village.

At a special meeting of the Dumfries Town Council, Provost Glover submitted a proposal in connection with the treatment of sewage to purchase the estate of Castledykes, at the south end of the town, and to use the flower gardens there as a site for septic tanks. He stated the purchase could be effected for £7000, including the mansion-house, and he suggested that this might one day be used as a museum. No pumping would be required at the works, and the whole scheme would cost about £17,000, or over £40,000 less than Mr. Carter's. The proposal was adopted, and a committee was appointed, with power to submit it to Lord Balfour after consultation with Mr. Carter. By this scheme an acre and a-quarter will be used for contact beds, instead of some twelve acres which Mr. Carter's scheme provided for.

Upon a report from Mr. Willcox to the Hanley Town Council on the suggested bacterial treatment of a portion of the sewage at the Hanley sewage works, the Sewage Sub-committee recommended that a new tank adjoining tank No. 5, but at 3ft. higher level, with a capacity of 500,000 gallons, should be provided at the works; that the two bacteria filters, having a total area of 2000 square yards, should be proceeded with; that Mr. Willcox should be instructed to provide a scheme for laying out the low-level land, with the view of meeting the requirements of the Local Government Board as to final treatment of the effluent before discharging it into the river; and that the sewage from the east side of Northwood should be treated on the bacteria system by means of small works at Sandy Finney Field. The recommendations were adopted.

The report of the City Engineer to the Sewerage and Irrigation Committee was presented to the Norwich Town Council last week. The sewerage works as contemplated are finished, and the estimate of five years ago has only been exceeded by something like 1 per cent. Anyone who has at all studied the matter will be aware that to come so near on five years' work, in such a field, and with prices continually going up, is no ordinary feat. Moreover, the sewers are working not only efficiently but economically; many of the old insanitary conditions have been got rid of by simple methods of re-formation, and the health of the city has considerably improved since the work reached its concluding stages. When water carriage for sewerage is universally adopted, and the middens swept away for good and all, Norwich will be able to be advertised as a health centre, and plans will be laid to recoup the ratepayers for all their outlay on sanitary works. The task has been a costly one. The £153,000 that was the amount of Mr. Collins' estimate is by no means the only item in the stupendous account which has been running ever since 1868.

The Local Government Board inquiry being held at Stockport into the application of the Corporation for an extension of the borough boundaries, was resumed on Wednesday in last week, that being the sixth day. Mr. W. Spinks, civil engineer, who prepared the plans of the Bredbury sewage works, said he had selected a site at the Rifle Range for the final treatment of the sewage. At the present time plans for the completion of the works were under consideration, and in his opinion Bredbury could deal satisfactorily with the sewage of Brinnington. If Stockport were to change its existing system of sewage treatment to the bacterial system the cost would be at least £100,000.

A Local Government Board inquiry was held at Coventry last week, into the proposal of the City Corporation to borrow £32,962 for sewerage works and surface-water drainage, including the construction of works in the parishes of Foleshill and St. Michael's Without, and £1150 for the purchase of land for street improvements. The City Engineer (Mr. J. E. Swindlehurst) went over the plans of the proposed sewerage system with the Commissioner, and explained fully about the details of the scheme to him. Answering questions put by Colonel Slacke, the Engineer said that the present means of sewage disposal pumping on the new sewage farm would be sufficient for the increase. They had at the present time a flow of about 3,000,000 gallons per diem, of which probably 1,000,000 was subsoil water. The total population estimated for was 80,000. That was the basis of the estimate, but the works would take a considerably larger amount than that. They had not estimated what the population would be in thirty years. The works were capable of extension on the present site, and the pumping capacity was 12,000,000 gallons per diem. The works were practically completed, with the exception of one engine, and pumping on to the farm would be begun last week.

WATER.

The Darlington Town Council contemplates an extension of the borough waterworks at a cost of £22.000.

At the West Gloucester Water Company's works at Frampton Cotterell, the formal opening of a new engine-house and pumping engine recently took place, in the presence of several directors, shareholders, and other gentlemen interested in the progress of the company.

The result of the poll on the proposal of the Margate Corporation to expend £150,000 in an effort to secure a water supply from the village of Wingham has resulted thus: For the Bill, 1443; against, 1807; majority against, 364. The proposal to increase the membership of the Town Council is rejected along with the water clauses of the Bill.

The syndicate which carried out successfully the water scheme for Wetherby has offered to undertake a new water scheme for Thorne. Hitherto the people of Thorne have been dependent on the canal and private wells for their water supply, and in spite of the order of the West Riding County Council that this unsatisfactory arrangement should cease, they are quite content to be as they were. In fact, bitter hostility is shown by the ratepayers to any alteration. The rates are already high, and any additional burden would fall heavily on the farm labourers, who form a large portion of the population. This being so, the offer of the syndicate may be very acceptable, provided the sanction of the County Council is obtained. The undertaking will no doubt prove an expensive one, but it is evident that a good supply of water can be obtained, and in course of time the scheme will assuredly develop into a good paying concern.

At the last meeting of the Bootle Rural Council the clerk reported that the Sub-committee on the Barrow Water Bill had met the Committee of the Ulverston Rural Council, and they had agreed to jointly file a petition against it. The cost of the petition would fall on the two districts according to the rateable value.

The March Urban District Council has decided to join with the Corporation of Wisbech in presenting a petition against the Bill now being promoted in Parliament by the Wisbech Waterworks Company. At Wisbech a poll of the inhabitants is to be taken. It was stated by a Wisbech contemporary that the real question behind the opposition to the Bill is the desire to obtain powers to purchase the undertaking.

At the last meeting of the Louth Town Council, the Highways Committee reported in favour of the purchase of the Louth Waterworks, and advised that £15,100 be offered for the undertaking. Dr. Best moved that a special meeting of the Corporation be held to consider correspondence from the Waterworks Company. He said the sum named was a startling amount. It was decided to discuss the question by a committee of the whole Council.

An ordinary general meeting of shareholders in the Felixstowe and Walton Waterworks Company was held last week. In their report, the directors stated that the dividend and interest account showed a balance of £1787 13s. 1d., and that they had pleasure in recommending the payment of a dividend of £5 5s. per cent. per annum on the original share capital, and £4 18s. on the additional share capital. The shareholders were also informed that the new tower, service tank, and cottages at Trimley will probably be completed before the summer season.

The Water Committee of the Liverpool City Council met last week. Mr. Wm. Houlding, the new member of the Committee, attended for the first time, and the Chairman, on behalf of the Committee, said they were very glad to see the new member of the Committee present, and he hoped he would be of great assistance to them. The engineer's report stated that the total quantity of water supplied, both within and outside the compulsory limits, for the week ending February 9th, was 182,848,000 gallons, as against 192,371,000 for the same period in 1900. For the week ending February 16th there were 189,311,000 gallons, as against 234,772,000 for the corresponding week last year.

The question of the water supply to Hadley was discussed at a meeting of the Wellington Rural District Council recently. The Clerk read communications from the East Salop Water Company expressing willingness to extend their scheme of supplying Oakengates with water to Hadley. Mr. M. H. Bailey said the Urban Council, in whose water area Hadley was, were no nearer supplying water to that place than twenty years ago. The East Shropshire Company were prepared to spend £70,000 on works, while the minimum cost of the scheme proposed by the County Council would reach £170,000. It was resolved to consider the question again after it had been brought before a special meeting of the Urban Council convened for that purpose.

LIGHTING.

Additional works in connection with the supply of electrical energy by the Liverpool Corporation are the subject of a proposed loan of £300,000.

There is to be moved at the next Gravesend Town Council meeting a motion to rescind the resolution passed to adopt the electric lighting scheme.

The result of the year's working of the Taunton electrical undertaking is a net profit of £706. The prices to private customers and places of worship are to be reduced to 4d. and 5d. respectively.

The South Metropolitan Gas Company contemplates a reduction in the price of gas of not less than 2d. per 1000 cubic feet from June.

The Committee of the Gillingham District Council has decided to recommend the Council to purchase the electric lighting works in that town at a valuation.

Following the example set by Shoreditch, by Poplar, and more recently by Fulham, the new borough of Hackney will, we understand, soon be in possession of its own electric light.

The fifth annual report of the Windsor Electrical Installation Company shows a net profit for the year of £4372 11s. 11d., and this would have been considerably increased but for the high price of coal.

The report of the directors of the Ascot District Gas Company for the half-year ended December 31st, states that, after providing for every charge against the half-year's working, there remains a balance of £2155 at the credit of profit and loss account, out of which the directors recommend that a dividend at the rate of 5 per cent. per annum be paid on the share capital, £967 being carried forward.

Last week the new gasholder at Stirling, which has been in process of construction for some months past, was formally inaugurated in presence of the directors and a few friends. Mr. Robert H. Donald, of the firm of Hanna, Donald, and Wilson, engineers, Paisley, on behalf of the contractors, presented Mr. James Johnston, chairman of the company, with a gold key, suitably inscribed, as a memento of the occasion.

Including the amount brought forward, the balance of revenue for the past year from the Brompton and Kensington Electricity Supply Company is £21,836. A dividend on the ordinary shares for the half-year is recommended at the rate of 7 per cent. per annum, making 6 per cent. for the year. The sum of £6000 is allowed for depreciation, £3000 placed to renewals expense account, and £488 carried forward. The directors propose to issue 8000 preference and 330 ordinary shares, in order to reduce the existing debenture stock.

After a year or two of hard work, in the course of which many unexpected difficulties have had to be surmounted, the scheme of the St. Anne's Council for lighting the town with electricity is now nearing its completion, and within a very few weeks from now the Council hope to have the works in full swing. The generating station, which is situated north of the gasworks, has been erected by Messrs. Moore Brothers, and is a substantial building of red brick, with freestone facings, and contains boiler-house, engine-room, accumulator-room, test-room, and workshop, store-room, and engineer's office. The boiler-house contains two multitubular boilers (by Stephenson and Co., Preston), each of 250 horse-power, and working at a pressure of 140 lb. per square inch.

Following hard upon the enterprise of the borough of Fulham, the London County Council inaugurated last Saturday its long-talked-of scheme for the illumination of the Victoria Embankment and Westminster Bridge by electricity. Mr. W. H. Dickinson, chairman of the Council, presided, and his little daughter performed the formality of switching the current to some of the parapet lamps of the Embankment, the little ceremony taking place at the generating station, which has been built beside the Charing-cross Station of the District Railway. The undertaking has been carried out by the Highways Committee at a cost of about £25,000, and will certainly help to remove the dreary and neglected appearance that has hitherto characterised the fine roadway from Westminster to Blackfriars after dark, while possibly, too, it may help to relieve the congestion of traffic in the Strand and Fleet-street.

Fulham's new electric lighting system, which has been installed at a cost of £130,000, was formally inaugurated last Thursday afternoon. In the course of the proceedings the consulting engineer mentioned that there was nothing in the plant which had not been manufactured in Great Britain.

GENERAL.

The Littlehampton Urban Council is considering tenders for paving the extended portion of the esplanade.

By order of the Pudsey Town Council, all houses in which fatal cases of consumption occur are to be thoroughly disinfected.

The Worcestershire County Council has agreed to apply to the Local Government Board for sanction to a loan of an additional £2000 for the Bromsgrove, Droitwich, and Redditch Hospital, making a total of £12,000.

During the month of January Mr. Kenneth Cameron, Sanitary Inspector, Aberdeen, seized and destroyed as unfit for human food 9870 lb. of beef, 132 lb. of mutton, 386 lb. of pork, 74 lb. of veal, 1176 lb. of offal, and 140 lb. of fish.

The electric tramway connecting Bournemouth with Poole is now practically completed, and will be inspected shortly by the Board of Trade. The construction of tramways within the borough of Bournemouth will shortly be commenced by the Corporation.

The Edmonton Board of Guardians has decided to carry out works at the Edmonton House with reference to alterations to the boiler-house, new chimney shaft, new 100 horse-power boiler, lift for new infirmary, and tanks, &c., for softening water, the cost of which is estimated at about £7000.

Dr. J. Wright Mason, Medical Officer of Health, Hull, has formally certified that no case or death from plague has taken place in the city and port since the recovery of the last patient who was discharged from the hospital on Monday, 11th instant, and that the steamer Friary, on which the outbreak of plague occurred, was allowed to leave the port on the 10th instant, after having been disinfected under his direction and to his satisfaction.

Besides the Tottenham scheme referred to on another page, the Housing Committee of the London County Council on Tuesday gave several particulars of the work it has in hand. On the Totterdown estate, Tooting, it is proposed to accommodate 8532 persons in 1244 cottages on the 38¾ acres. Four of the roads will be 45ft. wide, and these will be lined with plane trees. On the Reid's Brewery site, Clerkenwell, five-storey block dwellings all round will be erected, except on the Gray's Inn-road frontage, where the existing buildings will remain for the present. The main interior of the site will be occupied by five five-storey transverse blocks of dwellings, divided by yards and gardens. Another block of five-storey dwellings will occur in the narrow end of the site next Gray's Inn-road, and the remainder of the area will be laid out as a playground and garden. Exclusive of shops, accommodation will be provided for 2614 persons. On the Duke's-court, Drury-lane, site, 610 persons are to be housed in three blocks of five-storey dwellings. A noteworthy paragraph in the report reads:—"We have to report that during the year ended December 31st, 1900, weekly rents amounting to £93 16s. 9d., and charges for use and occupation amounting to £96 12s. 11d., have become irrecoverable in respect of the Council's dwellings. This represents a percentage of only ·50 on the total gross rents receivable during the year, viz., £37,451. Such a result appears to us to be highly satisfactory."

On Tuesday last the Leicester Town Council brought forward a proposal to the effect that "£50 shall be spent in providing, stocking, and distributing flower boxes to be placed in first-floor windows in some of the poorer neighbourhoods of the town."

After being closed for four weeks in consequence of an epidemic of measles, the schools under the Bo'ness and Carriden School Board have just been reopened, but a number of them have had to be closed again, there being no abatement of the prevalence of the disease.

Owing to the small-pox epidemic, Glasgow medical men are very busy with cases of re-vaccination, a fee of 1s. 6d. being paid by the authorities for all those who are unwilling or unable to pay the fee. Two hundred and forty thousand operations have taken place, but as the city contains nearly 600,000 adults, a special appeal has been made by the Town Council to those who have not yet been re-vaccinated.

Steady prosperity still attends the tramways of the London County Council. The traffic receipts during the week ended February 16th, 1901, amounted to £6946, including £126 from the all-night services, while the receipts for the corresponding week in 1900 amounted to £6759. The total receipts for the year, up to the same date, amounted to £48,908, while those for the corresponding period in 1900 were £48,507.

A street-cleaning machine, says *Indian Engineering*, has recently been tested in New York, which contains many features of interest. It is drawn by a couple of horses, and performs all the functions of a street-cleaning gang, except scraping the roadway with the rubber squeegees which are used on asphalt. A revolving broom sweeps the dirt to a conveyor, lifting it into a covered bin. Just in front of the broom there is a horizontal pipe through which jets of water are sprayed on the street so as to prevent dust. The dirt collected in the bin is distributed uniformly through it by means of a scraper, and when the bin is filled it can be discharged into a cart or on to the ground in a heap by letting down a door and scraping the contents out by a simple form of conveyor. The water is carried in a tank below the bin.

The subject of lady Corporation Inspectors was raised by Alderman Ruddin at the last meeting of the Liverpool Health Committee, who asked what they were doing. He referred to a particularly shocking case of child neglect and domestic squalor reported in the papers, and said he understood the female Inspectors were intended to visit such places and bring their existence to the knowledge of the Authorities. He thought clergymen connected with the different denominations might be asked to report such cases. Alderman Roberts said he thought, when they were appointed, those ladies would go into the houses of the poor, and that the city would get rid of all this squalor, crime, and child neglect. The Chairman reminded the Committee that there were but eight female Inspectors altogether. They went about the lower parts of the city, visiting the homes of the poor, and instructing them in domestic matters and the care of children. They reported on their work from day to day to Dr. Hope, the Medical Officer. It was very important but somewhat difficult work, and the ladies were working very hard. At first the poor people were inclined to resent their visits, but now, thanks to tact and kindness, they were generally well received. Alderman Roberts said something more ought to be done in such cases as Alderman Ruddin mentioned. The Chairman said the lady Inspectors were doing a good work, and their efforts had already had a good effect upon the health of the poorer localities. A member remarked that the cost of the lady Inspectors to the city was about £16 a week.

Turkish baths are to be provided by the Carlisle City Council at the public baths.

The Chard Union, Somerset, having appointed a licensed victualler one of their Sanitary Inspectors, have been informed by the Local Government Board that he cannot hold the office. The South Somerset Licensed Victuallers' Association are going to lay the facts before Parliament. We sincerely trust they will, for nothing is more to be desired than that these "jobs" should be made public. It is time that a stop was put to admitting such individuals to the public health service.

As the Rangoon Government proposes taking over the Rangoon Hospital, the reclamation works, and the new water scheme, it is not quite clear why Rangoon requires the services of a highly-paid municipal engineer. A saving of some thousands of rupees per mensem might easily be effected in the municipal works establishment now that Government Public Works Department officers are to do the principal work. The town roads will, of course, have to be kept in repair, but a highly-paid engineer is not wanted for that.

The low death-rate of Ilford, which has attracted attention of late years by reason of its rapid growth, was stated by the Medical Officer of Health to be 8·33 in the last report, while the birth-rate for a corresponding period averaged 36·33 per thousand. No wonder the numerous houses which are in constant course of erection so soon become tenanted. We know that environment has something to do with the death-rate, and a study of the returns raises the question as to whether it does not affect the birth-rate as well.

It is reported that the Special Committee of the Leicester Corporation has commissioned Mr. Manville, of London, to mature a scheme for applying electric traction to the whole of the Leicester tramways, as well as to a large extension of the present system, which has now been sanctioned. It is roughly estimated that the total expenditure on the acquisition of the present lines, and the completion of the new ones, will considerably exceed half a million sterling, if not reach three-quarters. The Committee had almost unanimously recommended the adoption of the overhead trolley system, but after the startling experience at Liverpool there is a strong revolution in feeling, and a growing determination to declare for the conduit system, though it must entail a large addition to the initial cost. The report of Mr. Manville is awaited with a good deal of interest.

A Local Government Board inquiry was held at Southport last week into an application by the Southport Corporation to acquire by compulsion about ten acres of land in the parish of Scarisbrick for the erection of an infectious diseases hospital. There was considerable opposition from Scarisbrick. The Town Clerk, Mr. J. E. Jarratt, who conducted the case for the Corporation, in opening, contended that a new site was absolutely necessary, and that, apart from the extravagant and prohibitive costs of a site within the borough, there would be tremendous opposition to such a site. The circumstances also in regard to the tenure of the land in the borough were exceptional, nearly the whole of it, with insignificant exceptions, being leasehold. The Sanitary Committee had been unable to find a suitable plot for a hospital within the borough, every unoccupied plot having been inspected. The owners of the land within and without the borough had refused to sell land to the Corporation by agreement, and they had to resort to compulsory powers. The site which had been chosen at Scarisbrick, and which was 1¾ miles from the boundary of the borough, was from a matter of necessity and desirability the best possible site for the purpose. There would be no danger to the neighbourhood, and no damage done to the landlord beyond what money could compensate.

At a meeting of the Hanley Town Council last week, the Medical Officer of Health reported that owing to the continued prevalence of diphtheria he had sent to the various schools a letter, in which he stated that in view of the likelihood that the disease was spread amongst children by the use of the same slates and slate pencils, which were frequently sucked by them, he thought it advisable that all the slates and pencils should be placed in a disinfecting liquid every night, and then washed each morning before being given out. He recommended the Corporation to supply the disinfectant. There were eleven cases of typhoid fever notified during January, and seven cases up to the 6th February. These cases were principally amongst children going to school, and several of them had been in the habit of eating ice-creams or ice-cream wafers. He inspected one of the localities where ice-cream was manufactured, and found it in a very dirty condition. Notice had been sent to limewash and cleanse the premises, but they had no power to prohibit the manufacture, unfortunately. He thought it would be advisable to take some samples of ice-cream and have them analysed bacteriologically.

PERSONAL.

Dr. B. H. Kingsford has been appointed Medical Officer and Public Vaccinator for Woking.

Dr. C. J. Ellis has been appointed Medical Officer and Public Vaccinator for No. 3 district of Battersea.

Mr. W. J. Coleman has been appointed Inspector of Nuisances for the rural district of Mutford and Lothlingland.

Dr. B. Kingsbury has been appointed Medical Officer and Public Vaccinator for the Woking district of Guildford.

Mr. G. F. Metzger, of Bath, has been appointed Chief Electrical Engineer for Manchester, at a salary of £800 per annum.

Dr. J. Fletcher Little has been reappointed Medical Officer of Health for Harrow, at a salary of £120 per annum.

The salary of Mr. O. M. Jonas, electrical engineer to the Dewsbury Corporation, has been advanced from £250 to £350 per annum.

Mr. C. F. Parkinson, Morecambe, has been appointed Electrical Engineer to the borough of Paisley at a salary of £250, with a free house.

Mr. E. Cross, the works engineer at the Aberdeen Corporation Electricity Works, has been appointed Electrical Engineer to the Rotherham Corporation.

Mr. Albert Ford, a native of Maldon, has been reappointed Manager of the gasworks at Singapore at a salary of £1000 per annum. He has held the position for four years.

Dr. Alex. Robb, of Hamilton, has been appointed Medical Officer of Health for the burgh of Paisley, in room of Dr. Robertson, who leaves for Leith. The salary will be £400 per annum.

The Bengal Government has confirmed the appointment of Mr. Alexander Hale, M. Inst. S.E., as Superintendent of the sanitary department of the Howrah Municipality, Calcutta. Mr. Hale, who is a Londoner, and an Associate of the Sanitary Institute, received his training as a Sanitary Inspector and Engineer under Mr. Moss Flower, C.E., of Bristol, and he was for many years chief of the sanitary department at Simla, the summer headquarters of the Viceroy of India. His frequent visits to the old country on leave have enabled him to keep his sanitary knowledge up to date.

Dr. Vincent O'Reilly has been appointed Medical Officer of Health and Public Vaccinator for Skelmersdale, in room of Dr. Morris.

Mr. C. W. Thompson, of Penrath, has been appointed Surveyor and Inspector of Nuisances for Ripley at a salary of £150 per annum.

Mr. F. C. Everett, District Surveyor, Liverpool, has been appointed an engineer on the staff of Mr. C. F. Wike, the City Surveyor of Sheffield.

Dr. P. Caldwell Smith has been appointed Medical Officer of Health for the borough of Wandsworth, at a salary of £800, rising to £1000 per annum.

The Grays Urban District Council has unanimously agreed to increase the salary of Mr. Arthur C. James, Surveyor to the Council, from £250 to £300 per annum.

Miss Florence Mary Nicholas, of Eltham, and Miss Mona W. Richardson, of Battersea, were appointed women Sanitary Inspectors for Southwark at the last meeting of the Borough Council. The commencing salary in each case is £110 per annum, rising to £160.

Mr. Neil J. Peters, of the Waterworks Engineer's Department of the Southampton Corporation, has been appointed Assistant Waterworks Engineer to the Cardiff Corporation. The commencing salary is £165 per annum, rising by annual increments of £20 to a maximum of £200.

The Hoylake and West Kirby District Council has resolved to permit Mr. Foster to resign his position as Surveyor and Inspector of Nuisances to the Council, and to appoint him as Engineer for the works authorised by the Improvement Act of 1900, at a remuneration of £1800, spread over three years, in the hope that at the expiration of that period he will be able to again take up the position of Surveyor to the Council, the present assistant being made Surveyor in the meantime.

At the last meeting of the Camberwell Borough Council, Mr. R. H. Lord, who has served the Vestry continuously for over twenty-three years, wrote resigning his position as accountant, and requesting the Council to grant him his superannuation according to the London Government Act. The resignation was accepted, and Mr. Lord was reappointed an officer of the Council temporarily pending the decision as to his compensation. It was decided that the future salary of the chief accountant should be £500 per annum.

LAW CASES.

Adulteration of Barley.

At Inverness on February 21st, before Sheriff Grant, Messrs. Anderson and Co., grocers, were charged at the instance of Mr. Alexander Knowles, Sanitary Inspector, with a contravention of Section 6 of the Food and Drugs Act, 1875, in having sold to the prosecutor 2 lb. of barley which was not of the nature, substance, and quality demanded, in respect that the sample purchased was found on analysis to possess a coating of powder to the extent of at least two per cent., and 40 per cent. of this powder being of the nature of fine white earthy matter or clay. The analyst's certificate added that the mineral addition had evidently been made for the purpose of improving the appearance of the barley. Mr. Herbert C. Boyd, solicitor, appeared for the prosecution, and Mr. C. O. Morris, solicitor, for the defence. Evidence was led, in the course of which it was elicited that the finer kind of barley, known as pearl barley, is distinguished from the commoner or ordinary pot barley by its fine white colour—a fact which, it was contended for the prosecution, was sufficient to account for the adulteration complained of. For the defence it was argued that the earthy matter might have been accumulated in the course of transit or manipulation. The Sheriff, however, found the charge proved, but as he was satisfied that the accused was not personally to blame, and as the case was of the nature of a test case, no previous case of barley adulteration being known to have occurred, he modified the penalty to £1, with £2 of costs.

A Deposit of Manure.

An action was recently brought in the Sheriff Court of Peeblesshire, under the Public Health (Scotland) Act, 1897, to have Alexander Roxburgh, farmer, interdicted from depositing any offensive matter or refuse within fifty yards of Thornielee Railway Station-house for a longer period than four days. Sheriff Pitman has granted interdict, and found the respondent liable in the sum of three guineas as modified expenses. In an exhaustive judgment he states that the respondent has been in the habit of receiving from two to four truckloads of Galashiels town refuse a day at Thornielee Station for use on his farm. In December a quantity of this refuse was deposited by him in a field adjoining the station and a public road. On 17th December the place was visited by Dr. Brock, the County Medical Officer, accompanied by the County Sanitary Inspector, and on the same day Dr. Brock reported to the Local Authority, in consequence of which the respondent was given notice to remove the offensive matter within forty-eight hours. It was proved that the manure was dangerous to health if deposited near a dwelling-house or a road, as was done in this case. Since May last the stationmaster's daughter had contracted a lung complaint, and though it was not proved that this was caused by the presence of the manure in the neighbourhood, it was impossible to provide her with the fresh air which had been prescribed, on account of the doctor having had to order the windows of the house to be closed in consequence of the ill-effects likely to follow from the effluvium of the manure. This was so strong that Dr. Brock's clothes smelt of it on the day following his inspection, though he had not been in direct contact with the manure. The deposit on the field was left for a longer period than was necessary for the purposes of agriculture, and the respondent's only excuse was that his ploughs were at the top of the hill, and it would have put out his arrangements to bring them down at that time. The Sheriff accordingly interdicted him from repeating the nuisance.

Alleged Insanitary Ship.

At Cardiff Police-court, before the Stipendiary, a case was heard in which Robert Forrester claimed £5 12s. from Robert Morrison.

Mr. Forsdike, instructed by the Sailors' and Firemen's Union, appeared for the plaintiff, and Mr. Ingledew for the defendant.

Plaintiff is a fireman, and was on February 7th engaged upon the s.s. Benvenue, belonging to defendant. It sailed from Cardiff on February 8th. Plaintiff and three others were engaged at the last moment, and when they got on board and were on the point of sailing they made their way to the fo'castle, and found it in a filthy condition, and they were deprived of the accommodation which the Act provided for them. Plaintiff and the others complained to the captain, who told them to go about their work. He said he would not until the fo'castle was put into a sanitary condition. When the ship arrived off Barry the captain brought the police on board, and plaintiff and his companions were taken before the Barry magistrates on a charge of refusing duty under the Merchant Shipping Act. The defendants on that occasion urged that the ship was in an unsanitary condition, and it was a fact that the

donkeyman was taken away by the Sanitary Authorities suffering from small-pox in its initial stages. After their discharge the men were vaccinated.

The STIPENDIARY asked if they claimed for the time during which they were recovering from the vaccination. Mr. Forsdike said that it was so. The Stipendiary said that he thought that too remote. The words of the Act were "receive any hurt or injury," and surely that referred to some bodily injury received in the course of employment. Mr. Forsdike urged that the fact that they had to be inoculated was due to the insanitary condition of the ship, and the Sanitary Authorities had compelled them to be vaccinated. Mr. Forsdike urged that a competent Court had decided that the men were justified in leaving work. Mr. Ingledew disputed the facts as set forth by Mr. Forsdike, and said that he was in a position to show that the men knew nothing about the small-pox until they were in the Barry police-station. The men were not discharged, for they went away of their own accord. Complainant was called, and admitted in his evidence that he said he would not work unless the captain took the ship into Barry.

The STIPENDIARY said that that finished the case. If the men started on board ship and dictated to the captain, all would be confusion. It was not for seamen to adjudicate if the ship were in an insanitary state, or even if it were unseaworthy. If the ship was in an insanitary state, how was it that it escaped the vigilance of the Sanitary Authorities? Port Sanitary Inspector Jenkins gave evidence to the effect that the ship was in a sanitary condition. Mr. Ingledew, in the interests of the owners, pointed out that the case of small-pox could not have been taken on board, since the period of incubation was twelve days, and the men were only on the ship two hours.

NOTES AND QUERIES.

Subscribers may obtain advice on matters appertaining to Public Health Law and Municipal and Sanitary Engineering. Letters should be addressed "Notes and Queries," THE SANITARY RECORD, 5, Fetter-lane, London, E.C. If an answer be required immediately, a stamped addressed envelope must be enclosed

2097.—FRIED-FISH SHOPS: BYE-LAWS AS TO.—"W. H. C." writes:—"My Committee are desirous of adopting a code of bye-laws for the regulation of fried-fish shops. I have an idea that such bye-laws are in force in some towns, but cannot find where. Could you or any of your readers give me information on the subject?"

Answer.—There is some doubt as to whether an urban Authority are enabled to adopt bye-laws to regulate the trade of a fried-fish dealer. It is true that Sec. 113 enables an urban Authority to make bye-laws with respect to *any* offensive trades; but, as interpreted by the Local Government Board, it appears that to bring any trade not specifically mentioned in Sec. 112 within the scope of Sec. 113, it must be shown to be *ejusdem generis* with those specified in Sec. 112, to the extent at least of involving "the collection of substances which, without anything done to them, must be, or by progress of time must necessarily become, a nuisance to the neighbourhood," and to be actually carried on in such a manner as to be noxious or offensive. Bye-laws under Sec. 113 have been allowed with respect to the trades of a dealer in rags and bones, a fish curer, and a dealer in fish offal. The Local Authority might, however, ask the Local Government Board if they are now prepared to confirm bye-laws with respect to fried-fish shops.

2098.—INSUFFICIENT WATER-CLOSETS: POWERS OF LOCAL AUTHORITY. — "Inspector" writes:—"In this urban district notices have been served upon owners under Sec. 36 of the Public Health Act, 1875, to provide sufficient water-closets, and for that purpose to provide cisterns and flushing apparatus to same. Will you kindly advise:—(1) Whether, on the owner's default, it is imperative that the Local Authority do the work? (2) Whether the Local Authority can proceed under any other section of the Act, and compel the owner to do the work?"

Answer.—(1) The Local Authority are not bound to proceed with the work on the owner's default. The proceeding is permissive. They may or may not do the work, as they deem fit. (2) The Authority may as an alternative proceed under Secs. 91 to 96 of the Act of 1875, but it will be necessary for them to proceed against the owners before the magistrates, and to satisfy the latter that a nuisance exists, owing to the absence of cisterns, &c. If the Public Health Acts Amendment Act, 1890, is in force in the district the Local Authority may adopt bye-laws under Sec. 23 of that Act with respect to the keeping of water-closets supplied with sufficient water for flushing, such bye-laws applying to existing buildings.

2099.—BACKYARDS IN AN OFFENSIVE CONDITION: BYE-LAWS AS TO.—"A. S. I." writes:—"In my district there is a serious nuisance committed on the surface of backyards by the throwing out of objectionable matter for fowls, and which is not cleared away. Could you inform me of any towns where printed notices have been issued to stop the practice, or where notices have been issued advising the burning of refuse instead of depositing it in the ashpit?"

Answer.—We are unable to give the names of any towns where such notices as those referred to have been issued. Perhaps some of our correspondents will be able to oblige with the information, and if they will communicate with us it will be appreciated. We may point out that the Local Authority may adopt bye-laws enforcing the paving of yards at the rear of houses, such bye-laws to apply both to new and old houses. See Sec. 23 of the Public Health Acts Amendment Act, 1890, and Handford and Mackenzie "Model Bye-laws," price 25s.

2100.—REFUSE DESTRUCTORS: FAILURES OF.—"S. A." writes: "I should be much obliged if you could inform me the names of any towns in England where destructors have been erected, and which have turned out a failure or not satisfactory?"

Answer.—We are unable to oblige our correspondent. Perhaps some of our readers may be able to send us information which will be useful to him. We may observe that some of the earlier forms of refuse destructors, as might be expected, were not free from defects, but so many improvements have been introduced in the construction of the furnaces that objections to refuse destructors on the grounds of their being likely to cause a nuisance are more sentimental than real. The querist might obtain Maxwell's excellent book on "Removal and Disposal of Town Refuse," price 15s., which is the best book obtainable on the subject of refuse destructors. He might also communicate with some of the manufacturers of refuse destructors who advertise in our pages.

2101.—CANNED FOODS: METHOD OF DETECTING AGE REQUIRED.—"T. G. W." writes:—"I should be obliged if you could inform me whether there is a mode of distinguishing fresh tinned foods from tinned foods such as that from ships' stores, which may be aged. I fancy I saw in THE SANITARY RECORD some years ago that where the tins or cans from old ships' stores had been cleaned and re-coloured, you could see the second piercing. In your issue of August 13th, 1897, Dr. John F. J. Sykes refers to the subject, and Dr. John Brown read a paper on 'Poisoning by Canned Foods,' which appeared in THE RECORD Supplement of October 29th, 1897. Neither of the authors, however, gives an indication as to how to distinguish ships' old stores from newly tinned foods."

Answer.—We regret we are unable to give the required information. We shall be pleased if any of our correspondents will write us if they can supply any information which will be helpful. As Dr. Sykes pointed out in 1897, "much of the tinned foods in the cheaper markets are derived from old ships' stores. A ship upon sailing lays in certain stores of tinned foods. It often happens these are not touched on the voyage, and they may go another voyage or not, but ultimately they are sold as old stores. The tins are then cleansed, re-coloured or re-varnished, and re-labelled with clean, fresh labels, and re-sold. Considerable quantities must find their way into the London markets, and be retailed in poor neighbourhoods." If there is any means of detecting this fraud, which is also the cause of much sickness among those who buy such tinned foods, we should be most willing to expose it.

2102.—BIOLOGICAL FILTERS: COMPLAINTS AS TO OFFENSIVE SMELLS. — "Engineer" writes:—"I enclose plans showing a sewage disposal scheme recently put in by me at a country school. There are complaints that the filters, which have been working twelve weeks, give off a very disagreeable smell, noticed by passers-by in the road some 20ft. away. The number of persons in the school is about fifty. The town's water supply is laid on. There are only four water-closets. Earth-closets are used by about thirty of the boys, so that the bulk of the sewage consists of waste-water from the bath, lavatory, sinks, and wash-house. The filters are worked alternately every twelve hours. This is the first I have carried out on this system. My own opinion is that there is too great a proportion of comparatively clean water, namely, from the shower and other baths used by the boys after football, &c. Will you kindly say if you know of any similar installation, and whether there is the same complaint or smell?"

Answer.—The odour complained of arises, we think it will be found, from the trapped detritus tank where the sewage under-

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goes decomposition. The odour, however, is generally very transitory, and can only be recognised within a small radius. Where such tanks are placed near highways or dwellings, to obviate complaints of nuisance the traps should be dispensed with, when the formation of scum will be prevented and offensiveness obviated. Or the tank may be dispensed with altogether, and the fresh sewage run directly upon the beds.

2103.—Housing of Working Classes: Railway Companies and Demolition.—"R. A." writes:—"Are railway companies under any obligation to provide dwellings for families displaced where extensions of their systems are about to be made? If so, kindly state the Act in force."

Answer.—No. There is no such obligation imposed upon them by any general Act.

2104.—Proceedings for Recovery of Expenses may be taken in County-court or before Magistrates.—"J. S." writes:—"Where expenses are incurred by a Local Authority under Sec. 41 of the Act of 1875, and are to be recovered in a summary manner, should such expenses be recovered in the County-court, as by Sec. 261, or before justices, as by Sec. 251, or may either course be adopted?"

Answer.—The Local Authority may at their option institute proceedings for the recovery of demands below £50, which they are empowered to recover in a summary manner in the County-court, or before a court of summary jurisdiction. They have absolute discretion.

2105.—Sewage Scheme, Clerk of Works: Parochial Committee have no Power of Appointment.—"Enquirer" writes:—"Has a Rural District Council power to appoint any person of experience as Clerk of Works, paying him a nominal salary, although he may not devote his whole time to it? May he be one that is an assistant in the engineer's office? After the Rural District Council have appointed him, can any other Committee raise any objection to his appointment and get it revoked?"

Answer.—A Parochial Committee has no power to appoint any officer in connection with the sewerage scheme. The appointment of such and the revocation thereof rests entirely with the Rural District Council. Unless, therefore, the Rural District Council revokes the appointment, the officer cannot be removed. The Rural District Council may appoint any person it chooses.

2106.—Architecture and Building Construction: How to Learn.—"R. W." writes:—"I have recently passed the examination for Inspectors of Nuisances, and now want to acquire some knowledge of architecture. What is the best way to acquire this? Does the Society of Architects hold examinations, and do they allow anyone to sit for the examination, and what books do you recommend?"

Answer.—The querist is advised to join a science and art class in building construction in connection with some technical classes. Such classes are held in the evening. After he has passed the first and second stages in the subject he will then be able to determine whether he is likely to succeed, or has an inclination to further pursue the study. Neither the subject of building construction nor architecture can be acquired without the aid of a teacher or an architect. For the examination referred to it is necessary that the candidate should have served his time with an architect.

2107.—Piggeries: Urban Authorities may Make Bye-Laws as to.—"A. S. I." writes:—"I am an Inspector of Nuisances to an Urban Authority. Will you please advise:—(1) Can my Council make bye-laws in relation to the keeping of swine so as to regulate their distance from dwelling-houses, and as to cubic space, and as to lighting, ventilation, and drainage? (2) Can you tell me of a town where such bye-laws have been adopted? (3) Can my Council stop anyone from keeping swine after a date to be specified by them? (4) Can you tell me of any book from which I could draw up bye-laws as regards the keeping of swine?"

Answer.—(1) An Urban Council may make bye-laws for the prevention of the keeping of animals (swine, &c.) on any premises so as to be injurious to health under Sec. 44 of the Public Health Act, 1875. Such bye-laws usually prohibit the keeping of swine or the depositing of swine's dung within the distance of 100ft. from any dwelling. This bye-law applies whether the swine are a nuisance to any person or otherwise, and applies to existing piggeries as well as to future ones. (2) Such bye-laws are in force in most towns in the kingdom, and the querist is advised to communicate with the Inspectors of any half-dozen towns for a copy of their bye-laws in force with regard to the keeping of swine. (3) No. But after the adoption of the bye-laws and their confirmation by the Local Government Board as required by Sec. 184 of the Act of 1875, they cannot be kept within the prescribed distance as stated in the bye-laws. But an Urban Authority cannot absolutely prohibit the keeping of swine. The provisions of Sec. 47 of the Act of 1875 may also be referred to. (4) Knight's "Annotated Model Bye-laws," price 12s. 6d., or Handford and Mackenzie's "Model Bye-laws" (in two vols.), price 25s. should be obtained. These books each contain model bye-laws which can be adopted as to the keeping of animals and numerous other subjects. Either of the books may be obtained from the office of this journal, post free on receipt of the published price.

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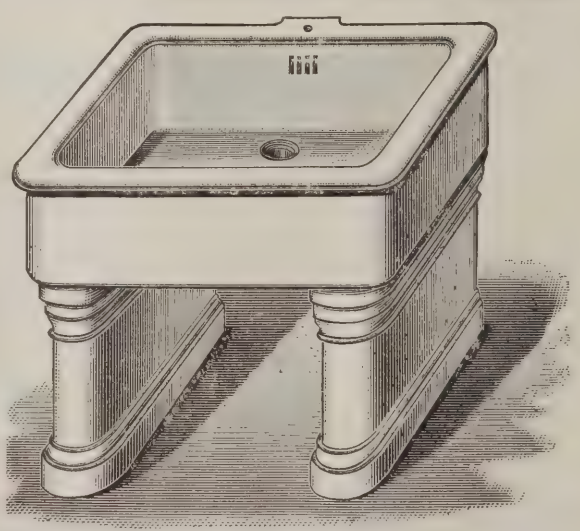

J. & M. CRAIG, Ltd., KILMARNOCK

SOCIETY OF ENGINEERS.

At a meeting of the Society held on Monday, March 4th, Mr. Charles Mason, President, in the chair, a paper on "Notes on Certain Details of Drainage Construction" was read by Mr. Gerard J. G. Jensen, who said that the subject was not unfamiliar to the members of the Society, as a few years ago an excellent paper on "The Drainage of Town Houses" was read before them by Mr. G. M. Lawford.

In preparing the present paper the author has, therefore, endeavoured to avoid repetition, and to confine himself to certain details of drainage construction which might serve to amplify Mr. Lawford's paper, and which, at the same time, might give rise to a profitable discussion upon points which are frequently misunderstood, or which have not received the attention that they undoubtedly deserve.

Chief amongst the details of construction which may be brought under notice are a number of those pertaining to ventilation pipes. As with soil-pipes, so also with ventilation pipes, the materials made use of in their construction are, it may be said, confined to lead and iron. In the southern counties lead is perhaps the material mostly used; but in the north—from Lancashire upwards—iron soil-pipes and ventilation pipes are—in the author's experience, at any rate—in preponderance. While the suitability and efficiency of iron for soil-pipes cannot be denied, the use of iron for ventilation pipes is, the author submits, most inadvisable.

Fig. 1

Fig. 2

Fig. 3

The interiors of soil-pipes through which there is a flow of sewage are, almost from the commencement of their life, coated with a greasy film of a slime-like nature. This film, so long as it remains moist—as it invariably does when the soil-pipes, or even only the drains, are in use—effectually protects the interior surfaces of iron soil-pipes against corrosion. Should it fail and corrosion actually take place, the scales of rust falling into the pipe will be cleared away by the next flush of the closet. At the worst, should the rust accumulate sufficiently to cause a stoppage, the fact will soon be indicated by an overflow of sewage from the closet basin; when, doubtless, even the most indifferent householder would cause something to be done.

None of these considerations are applicable to ventilation pipes. There being no flow of sewage through them, no protective film will be formed. If of iron, even though the pipes be treated by one or other of the processes designed to protect them against corrosion, ventilation pipes will soon begin to rust in the interior, and the scales of rust falling into the pipes to the next bend or offset, will accumulate and cause a stoppage at that point, there being no flush to remove the scales. Once blocked, the ventilation of the drainage system will be partially or totally, and possibly permanently, interfered with, for the number of householders who cause their drains to be examined periodically is still, unfortunately, small.

To obviate stoppages by rust, rust chambers or pockets (Figs. 1 and 2) are frequently fixed on ventilation pipes at the points were the blockages would be most liable to occur. This course is certainly advisable, and should invariably be adopted when the pipes are of iron. In the author's opinion, however, the proper cure for the evil lies in the avoidance of iron piping, for apart from the fact that prevention is better than cure, the continuous corrosion which takes place in iron ventilation pipes seriously weakens their strength, and sooner or later necessitates their replacement. The employment of lead, and lead only, for ventilation pipes may, he thinks, be advantageously carried so far even as to include those portions of soil-pipes which act purely as ventilation pipes, when, owing to cost, strength, or other considerations, the soil-pipes proper must be constructed of iron; unless, indeed, lead-lined iron pipes are made use of for the whole stack.

It is a generally accepted rule amongst sanitary engineers, that ventilation pipes should be fixed, as far as possible, in straight lines and with as few and as easy bends as possible. The reason for this is obvious; since bends, by increasing friction, seriously diminish the ventilating action of the pipes, and this to such an extent that it is estimated that a single sharp bend or angle may reduce the air current by about one-half. Bends in some shape or other cannot, however, always be avoided, and it would, therefore, be well to consider means by which their evil tendencies could be minimised or neutralised. This, the author thinks, could be arrived at by suitably increasing the diameter of the pipes at the points at which bends occur. The idea has only recently occurred to him, and not yet having had an opportunity of carrying out experiments thereon, he is unable to give any definite views on the subject. It is not improbable, however, that some of those present may have had similar ideas, and that of these, some, at least, may have been tested in practice. If such be the case, it is hoped that those present who have made any such tests will give the results of their experience in discussing the present paper, or that, in the opposite case, they will give their views upon the author's suggestion.

Although much has already been written and said as regards the desirability of providing outlet ventilation pipes with cowls, the subject still remains debated. The deleterious effects of cowls which provide shelter for bird nests, which in time refuse to respond to the winds or which prove a fruitful source of annoyance by their noise, are so well known as not to require recapitulation. All these evils, some maintain, may be readily avoided by making use of a cowl which is not liable to them, and which is reliable under all conditions. Whether such a cowl actually exists outside the minds of patentees is perhaps questionable, but it may prove interesting to record a case in which a cowl which, at the time, thoroughly fulfilled its duties, proved a source of danger by its very efficiency. This cowl was fixed upon the outlet of a soil-pipe which received the discharge of two closets, and it so happened that whilst the cowl created an upward current in the pipe, the discharge of the lower closet tended to create an equally strong downward current, with the almost invariable result that the water contained by the trap of the upper closet was sufficiently syphoned out to destroy the seal of the trap. This experiment tends to strengthen the opinion which the author has long held, that the use of cowls should be avoided, and that nothing can exceed in efficiency a copper-wire guard (Fig. 3) as a terminal for soil-pipes, if not also for all other ventilation pipes. This opinion applies equally to those cowls which are designed to prevent "blow-downs," and which are advocated by many. If such a cowl is efficient, then the resistance which it offers to a downward current of air, created by the discharge of a closet, must be overcome. If it is not, the probability is that syphonage will take place. The free ingress of air to the soil-pipe at the right moment is much more important than the extraction of a large quantity of air or the prevention of an occasional back-draught.

Whilst, theoretically, there should be little or nothing obnoxious or dangerous in the air discharged by the outlet ventilation shafts of skilfully-designed and efficiently-constructed drainage systems, yet it is desirable that the openings of these pipes should be placed in positions in which the liberation of foul gases would be attended by the least possible risk of danger to health. There are times, even in the most perfect system of drainage, when, owing to a temporary insufficient supply of water or from some other such cause, a certain quantity of sewage is unduly retained in the drains, and there permitted to putrefy. There are also drains in which, owing to scamping on the part of the contractor, or accidental error on the part of the designer, the retention of decomposing sewage is the rule rather than the exception. In such cases, if it has been the designer's invariable rule to select, with the utmost care, the points at which outlet ventilation pipes should terminate, little harm may result. If, on the other hand, the terminals have been placed at the most convenient (as against the most suitable) points—irrespective of the positions of windows or other openings into the house or of the prevailing winds, the results may be serious.

It is unfortunate and hardly creditable that the relationship between emanations from ventilation pipes and health should hitherto have received such scant attention from engineers, medical men, and others interested in sanitation as to leave the subject utterly vague. There are no facts from which to determine the smallest distance from a window at which it would be safe to liberate these emanations. There is nothing to show whether that which would be a safe distance or height in one case would be equally so in another. Nor, even, is there any positive knowledge as to the manner in which drain and sewer air is detrimental to health. The plausible suggestion that the ill-effects of drain and sewer air are due to their action in conveying specific germs of disease has been, if not disproved, at least rendered extremely doubtful by practical experiment and experience. That they owe their evil properties to their gross chemical composition or to any one or more of the gases known to be present, has, further, been disproved by Dr. Alessi's experiments. The probability now is, therefore, that the human system is affected either by the presence of some poisonous gas which has so far escaped analysis or that there is some toxic principle present which up to the present has proved itself too subtle to be detected. Whatever the cause, however, there can be little doubt as to the effect of inhaling foul gases given off by ventilation pipes. No specific disease will, perhaps, be communicated, but the constitution will be so lowered and prepared as to fall a ready prey to a number of more or less serious illnesses. This fact was strikingly brought out by the experiments of Dr. Alessi, in which he proved that guinea pigs and rats, which are naturally immune to typhoid, proved ready victims to the fever when prepared for it by exposure to emanations from a soil-pipe.

Granted this elementary and unsatisfactory state of knowledge, it is at least desirable that the engineer and architect (for architects also design systems of drainage) should err, if at all, on the side of safety. That this is not always the case is, unfortunately, only a matter of too common experience. As an instance, the author may mention that he was last year called upon to inspect the drainage of a large school in which some two hundred pupils are housed, and in which epidemics of follicular tonsilitis have periodically raged. Structurally, he found the drainage perfect. Cost, apparently, had been (as it rightly should be) a minor consideration, for the best possible materials, and, apparently the most skilful labour—even to the point of extravagance—had been employed. Although the drainage was extensive and hundreds of various fittings were fixed in the different buildings, there was not so much as a slight leakage. With the design the case was altogether different. The drains were excessive in size, laid with insufficient fall, insufficiently ventilated and practically unflushed. As a consequence they were in a highly offensive condition. The gases so generated in the drains were discharged by a number of ventilation shafts which, almost without exception terminated—and do so now—in close proximity to and on a level with windows, the majority of which are dormitory windows.

An analysis of the cases of tonsilitis which occurred at that time and during one or two outbreaks since, showed that the cases were most numerous in the dormitories most affected by the ventilation pipes; that they were smaller in number proportionately as the dormitories were less exposed, and that one dormitory which has not a ventilation shaft in the immediate vicinity of windows which might affect it, had, as far as was known, entirely escaped. Now these facts are remarkable, since the pupils drink the same water and milk, eat the same food, and mix together freely during the day. That the tonsilitis was caused by the ventilation pipes directly is, of course, hardly probable, but that they predisposed the pupils to its attacks can, in view of these facts, hardly be doubted, even though the infection may have been imported in the first instance, and subsequently communicated from one pupil to another.

As a result of his inspection and investigations, the author made certain suggestions for minimising the risks to which, in his opinion, the drainage gave rise; but, as these were not adopted, it is presumed that the school council does not share his views. That they should not have been agreed to by the designer (the architect by whom the buildings and their drainage had been designed), was, perhaps, only to be expected, but it is worthy of note that one of the reasons given for this want of agreement was that there exists a ventilation pipe within a short distance of the windows of the designer's house, and that neither he nor his family had experienced any ill-effects from that source. Such an excuse would, on the one hand, be impossible, or, on the other, more convincing, were generally accepted and reliable facts and investigations available which could carry weight with impartial minds. Meanwhile, the evils at the school referred to not only continue, but are probably even being aggravated. A sanatorium has been built and provided with two drain-ventilation shafts which terminate in proximity to and on a level with the ventilation openings of the wards. What, if any, effect these will have on the patients remains to be seen, but the pity is that the experiments may involve human suffering, and that the subjects to be experimented upon are not guinea pigs, nor rats, but human beings.

The subject of ventilation pipes, in their relation to health, then, is one demanding the most careful study and observation; more especially since it is now not unusual to ventilate sewers also in proximity to the roofs and windows of houses; either by special ventilation shafts, or, as in some districts, through the house drains. Whilst experiments would perhaps be most conveniently carried out by municipal engineers and Medical Officers of Health working together for their own authorities, or by some such representative body as the Sanitary Institute, there is no doubt that the individual efforts of engineers generally would be productive of much good, and lead towards a solution of the problem. Until that is reached, it will be well to assume the worst, and to endeavour to guard against it, even at the cost of appearance and convenience. Who can say but that, by giving proper attention to the terminals of ventilation pipes, it may be possible to further increase the well-being of the community, and to further reduce the death-rates which have been already lowered by modern sanitation?

Coming now to anti-syphonage pipes, the author desires to draw attention to its two extremities. In the first place, it would appear that but scant attention is frequently bestowed upon the connection of the anti-syphonage pipe with the trap which it is to serve. More often than not it is found that the pipe has been branched in at the very spot at which it is most predisposed to blockage; that is, on the crown of the trap. By reference to Fig. 4. which shows such a connection,

Fig. 4

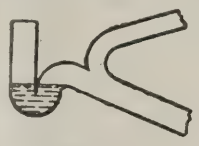

Fig. 5

it will be seen that whatever passes through the trap with any degree of force is almost certain to be washed into the anti-syphonage pipe. That this actually does take place is only too fully proved by the number of stopped-up anti-syphonage pipes daily met with. The evil can easily be avoided by fixing the pipes at a short distance from the crowns of the traps, as indicated in Fig. 5. In this connection it is satisfactory to note that the evil has been provided against in the London County Council's proposed new bye-laws, in which it is required that the anti-syphonage pipe shall be connected with the outlet of the trap at a point not less than 3in. and not more than 12in. from the highest part of the trap. It is further required that the connection should be curved in the direction of the flow, as illustrated in Fig. 5.

As regards the upper extremities of anti-syphonage pipes, the common practice is either to continue them up to the same level as the soil or waste pipes in connection with which they are fixed (see Fig. 6), or to branch them into the latter at a height of a few feet

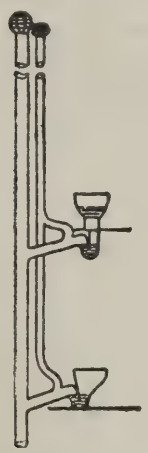

Fig. 6

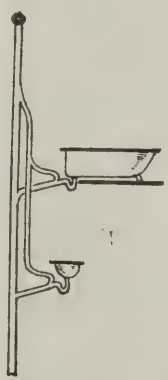

Fig. 7

above the level of the highest fitting on the stack. This method is illustrated in Fig. 7, and the author submits that it is the one which is by far to be preferred. By adopting it, the intake of air for the anti-syphonage pipe is practically brought much nearer to the fittings than would otherwise be the case. The air would, for some distance, be drawn through a comparatively large pipe, resistance by friction being thereby reduced. At the same time some benefit will be derived by the inrush of air into the stack pipe which follows the discharge of a fitting. The system is also the cheaper one, owing to the piping and fixing saved.

Although progress in the science of arranging and constructing waste pipes cannot be said to have lagged behind progress in other portions of the drainage system, there is perhaps no other part of the sanitary arrangements of buildings in which so much conservatism has been shown. Certainly, no other reason than conservatism can be ascribed for the continued construction of waste pipes from the upper floors upon that ancient and reprehensible plan which provides an open hopper head upon the main waste pipe at each point at which it is desired to branch in a waste pipe from a fitting (see Fig. 8). That the system is a fruitful source of nuisance must be evident to all who have given the subject a thought.

Two or three waste pipes of small diameter, conveying, possibly, highly offensive liquids, are arranged to discharge with the utmost possible amount of splashing into a comparatively large open hopper, whence the discharge is carried to the next hopper, through a pipe far too large for the purpose, and there again permitted to splash. This is repeated several times, according to the number of floors or fittings in the house, after which the waste water is allowed to find its way into a gulley

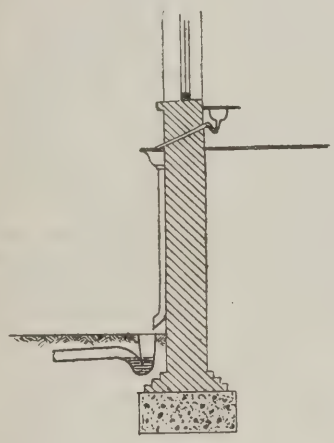

Fig. 8

trap, or possibly into an open, 18in. long channel leading to a trapped gulley. This splashing and the inefficient flushing to which these stack pipes are subjected soon permit the hoppers and piping to become coated with soap-suds, grease, and other organic matter. The emanations from these are free to issue at each hopper head, and thence to be drawn into the house through the windows, in proximity to which the hoppers are usually fixed. Nor, indeed, is decomposition necessary to render the waste pipes offensive, since it is but necessary to discharge some cabbage water or other evil-smelling waste water into the pipe at one floor for the fact to be immediately evident on the various other floors of the building. It is perhaps under the, at present, fashionable flat-life that the full benefit of the system is experienced, and it must be a source of great satisfaction to the cooks to know exactly what the various families in the building are about to eat; in so far, at least, as it is possible to judge by the discharges of the kitchen sinks.

(*To be continued.*)

PORTSMOUTH is face to face with a difficulty. The Drainage Committee applied to the Admiralty to grant additional time for the discharge of the town's sewage into the receiving tanks at Eastney, and while no direct reply has been sent, the Committee has received from the Admiralty a letter to the effect that if the necessary work for the discharge of the sewage within the stipulated time is not proceeded with the Treasury will probably withdraw its contribution to the sanitary rate. This means a loss of £20,000 per annum, and the Committee has therefore decided to recommend a new scheme of drainage, involving an outlay of £150,000.

EPIDEMIOLOGICAL SOCIETY.

At a meeting on February 15th, Dr. P. Manson, C.M.G., F.R.S., president, in the chair, a paper was read by Dr. A. Newsholme, on the "Epidemiology of Scarlet Fever in Relation to the Utility of Isolation." He admitted that the problem was, in the present state of our knowledge, insoluble, but its discussion would serve to indicate the proper lines of inquiry and of safety in practice. Though the micro-organism of scarlet fever had not been certainly identified, there could be no doubt as to its existence. It was killed by heat and disinfectants, and the disease was communicable by personal intercourse, fomites, and vehicles as milk. Until, therefore, we knew more of its natural history, it was obviously our duty to combat it by the only means at present available, disinfection of things, and the isolation of persons affected. One notable feature of the disease was that of the regular succession of cyclical waves of prevalence and mortality; in pre-notification years we had but the latter to guide us, but now we could observe its prevalence and fatality. From 1859 to 1883 the death-rate never fell below 0·28 per 1000 of the population, except in 1873, when, after a period of excessive mortality it was 0·19. In the years of maximum mortality it had been 1·28, 1·71, 1·87, and 1·06. Since 1884, however, the highest mortalities had been at the rates of 0·36 and 0·37, and the lowest 0·19 in 1899, and in 1900 only 0·08 per 1000, though these had been in years of excessive prevalence.

This change, though coinciding in point of time with the practice of isolation in hospitals, could not be wholly ascribed thereto, for it had been observed more or less on the Continent and in America, where such isolation had not been adopted. In Prague the death-rates in the ten years preceding 1884 had ranged from 1·30 and 1·33 to 0·19 and 0·20, and in the ten years following from 0·94 to 0·17. In Christiania between 1860 and 1883 the maxima were 3·05, 2·58, and 2·19, and the minima 0·2, 0·03, and 0·04; and between 1884 and 1893 1·36, 1·30, and 1·23 and 0·23, 0·24 and 0·26. In Berlin there was an improvement from an average of 0·50 to 0·80, and 0·32 to 0·03; in Paris the mortality has always been remarkably low, 0·07 to 0·19, although the death-rate from diphtheria was higher than in any other city of Western Europe. In Boston, U.S., where diphtheria was even more rife, and in Montreal, the years of highest scarlatina mortality corresponded with those of the lowest from diphtheria, and *vice versâ*. This might suggest a complementary relation between the two diseases; but in Berlin and Christiania the years of highest mortality from each had coincided; and in New York they had coincided and alternated at different times. The extraordinary range of the oscillations in the mortality from scarlatina in Christiania was characteristic of communities in which no isolation was attempted, the extreme minima following extreme maxima indicating the exhaustion of susceptible material for a time. Though the better sanitary conditions of the people —taking the word in its widest connotation, and including the higher standard of living among the masses— had been productive of inestimable benefits in all civilised communities, it could not be shown to have contributed to the lessened mortality from scarlatina, which was far from being universal; but from a comparison of English towns with Christiania and Boston, we were justified in concluding that isolation of cases did at least have the effect of protracting the course and moderating the severity of each cyclical epidemic. But we must not be hasty in assuming that the attenuation of the virulence of the disease, as seen in the reduction of the fatality (in some years and towns to less than 1 per cent. of the hospital cases) would be permanent; for the like cycles of fatality had been observed at the beginning of the nineteenth century, when the improvement was ascribed by Dr. Graves to the depletory method of treatment, until he was disillusioned by the recurrence of its former virulence. And even now malignant cases were (though rarely) met with, but that these were due to any intensification consequent on so-called aggregation of cases in hospitals he could not allow in the absence of an iota of evidence. Nor could he assent to the general belief that the low mortality was wholly due to this lessened fatality, for a comparison of the rates of sickness mortality and fatality in years of maximum and minimum prevalence in Christiania from 1860 to 1893 did not show any constant or progressive improvement in this respect. The sickness and mortality per 1000 population and the fatality per cent. for the minimum years averaged 1·44, 0·166, and 9·3, and for the maximum years, 11·25, 1·79, and 17·6, the means for the whole period 1861 to 1890 being 5·51, 0·66, and 12·1. The statistics of Boston gave similar results, though the rates were more uniform, and the means for 1877 to 1895 were 3·28, 0·30, and 9·0 respectively. In London the fatality had sunk from 5·1 in 1891 to little over 2·0 in the last two years. In all inquiries of this kind it was absolutely imperative to compare years of maximum prevalence in one town with the same in others, and those of minimum prevalence and mortality in like manner. The statistics of hospital cases and of those treated at home should be kept distinct, for while there was no question as to the actual fatality among the former that of the latter was always open to doubt from the fact that a large proportion were never notified; the result being that their number was greatly under-estimated and their fatality exaggerated. Thus only could one explain the alleged fatality of 28·5 per cent. for home cases at Huddersfield against 1·5 per cent. in the hospital. In the houses of the lower and lower middle classes isolation was impracticable, and if the removal of the first case did no more than delay the contraction of the disease by the other children for a few years it would affect the general mortality favourably, the fatality being greatly influenced by age.

To determine the extent to which hospitals tended to check the spread of the disease, he had been collecting statistics, too few, as yet, for positive conclusions, but sufficient to indicate the lines on which such investigations should be conducted. Taking a number of houses, (*a*) from which the first case had been removed so soon as notified, or (*b*) not until secondary cases had appeared, and (*c*) where the patients were treated at home, he noted and tabulated the numbers of subsidiary cases in each class, the period that had elapsed between the onset of each, and of that immediately preceding, as well as since its removal; the number of persons in the same families, and in other families occupying the same houses, under and over twenty years of age, who escaped; with the attack rate for each during the rise and decline of an epidemic, and other data, all of which were greatly in favour of hospital treatment even in their crude state, while every proper correction or revision made them more so; *e.g.*, most of the cases treated at home were so because there was ample room for isolation without removal, or because there were no other children in the houses to whom the disease could spread; and, on the other hand, secondary cases appearing later than a week after the removal and before the return of the first, could not be due to personal infection from it; and in many the patient was not removed until too late for prevention, some, indeed, not until the second or third weeks. As to the alleged higher mortality among "return" cases, even when properly so called, it was a well-known feature of the disease that successive cases in a family progressed in violence, especially when treated at home.

Mr. Shirley Murphy defended isolation hospitals as removing one means of communication, though others remained to be discovered; statistical results

from comparison of isolating and non-isolating towns, apparently against the former, must be falsified by errors of method or by ignoring local circumstances as well as cyclical variations of prevalence and mortality. In 1893 when from the seventeenth to the twentieth week the Metropolitan Asylums Board failed to meet the demand, and many patients were treated at home, the number of secondary cases rose rapidly.

Dr. Franklin Parsons pointed out that it was but recently that hospital isolation had been at all generally adopted, yet the mortality from the "isolated" diseases had sunk far more than that from measles and others that were not, and it was evident that the aggregation of cases and concentration of the infection was greater in a confined room than in a hospital ward.

Dr. P. Boobbyer (M.O.H., Nottingham) fully agreed with Dr. Newsholme and others as to the fallacy introduced into all statistics of towns with and without isolation by the non-recognition of cyclical waves of prevalence and of fatality and of local conditions, sanitary and social, but he wished to emphasise one factor that had been wholly ignored—the influence of neighbouring towns and villages. What availed the efforts of a Municipal Authority when the teeming population of surrounding districts, insanitary, and in which no precautions whatever were taken, poured daily into their factories and markets? But even the towns that were credited with the best work did less than they might do, or were supposed to have done. How else could one explain the huge discrepancy between the known death-rate of 1·5 per cent. among the hospital cases and the alleged but incredible rate of 28·5 per cent. among those treated at home, given for Huddersfield, except by assuming, *inter alia*, that 90 per cent. or more of the latter were not notified at all? Perhaps the hospitals would never achieve what was expected of them, for scarlet fever might be but the manifestation of one phase in the life history of an organism of which the others, parasitic or saprophytic, were unknown. He had long recognised the greater severity of return cases; but among 1200 so-called in one year only sixteen had died. From one orphanage sending all its sick to hospital no return cases had been received, while in another, where four had to be refused for want of room, forty-two secondary cases followed.

Dr. Louis Parkes pointed out the economic advantages of hospital isolation in enabling the parents and others to follow their usual employments, and suggested that the possible presence of the microbe in apparently healthy throats might be a source of infection, as it was in the case of diphtheria, that notification and isolation could not prevent.

Dr. Kenwood, considering hospital isolation indispensable for the poor, protested against the indiscriminate admission of patients of all classes, to the exclusion, virtually, if not officially, of those suffering from far more fatal diseases. In his district of Finchley the children of the poor died of diphtheria while the beds in the hospital were filled with scarlet fever cases, some coming from houses rented at £100 per annum. Half the expenditure of the Metropolitan Asylums Board thus spent might much better be devoted to the medical inspection of schools and other purposes. Even measles was at the present time more fatal than scarlatina; indeed, he had had several hundred cases of scarlet fever through his hospital in the course of eight years without a single death.

Dr. E. F. Willoughby expressed his regret that in this discussion, and in that in "another place," no reference had been made to the age constitution of the populations of the towns under consideration; for scarlatina being a disease of early life, and rarely fatal after the tenth year, the mortality in a town must be greatly influenced by it; and for scientific, though not official, purposes might well be calculated on the number of children living under that age, since, to take an extreme case, they contributed 24 per cent. of the total populations of London and that of Berlin, but only 12 per cent. of that of Paris; so that equal death-rates per 1000 population would indicate a mortality in Paris twice as high as in London or Berlin among those who were susceptible, and to whom the mortality was practically confined.

After some remarks by Drs. Bulstrode, Sweeting, W. A. Bond, and Theodore Thompson, the President defended what Dr. Kenwood had called indiscriminate admission on the grounds of the difficulty of drawing a line as to eligibility, since a man's occupation was of more importance to the public than his income. He had sent his children to a hospital in the interests of his practice and patients. The suggestion of a parasitic phase of scarlet fever in other animals was favoured by its remarkable limitation to temperate climates, for it was a character common to all diseases of that nature to be restricted to particular climates or regions.

Dr. Newsholme said that Dr. Millard's error consisted not in the shortness of the period on which his statistics were based, but in his method of applying them, which ignored the different years of incidence of the maximum of prevalence and of mortality in different towns. He maintained that all ratepayers had a right to hospital treatment, which he believed was always better, but if any selection of cases were made it should be based, not on the social position of the families but on the risk of the spread of infection in each case. He entirely agreed with the importance of taking the age constitution of a population into consideration in comparing one town with another, but had not as yet been able to obtain the information desired by Dr. Willoughby. He thought that Dr. Kenwood's remarkably low mortality might be due to his indiscriminate admission of cases, and that its limitation would lead to a recrudescence of the fatality in future.

CLEANSING BACKYARDS.

The following handbill is periodically circulated among the residents of Batley, and has helped materially to improve the condition of the district.

Borough of Batley, Sanitary Department.

The Sanitary Committee of the Batley Corporation urgently invite the co-operation of the inhabitants of this borough in taking steps to obviate as far as possible the great nuisance and injury to health arising from the putrefaction of animal and vegetable matter. Fish bones and heads, the entrails of fowls or rabbits, the peelings of potatoes, the husks of peas, cabbage leaves, &c., should not be deposited in the ashpits, but should be placed at the back of the fire, or underneath the fire-grate until dried, and afterwards be put upon the fire and consumed. No smell will be experienced if this is properly carried out.

All slops should be poured down the drains, and not thrown into the ashpit.

The Committee trust that occupiers of houses will aid them in promoting the health and comfort of all by invariably adopting these simple precautions.

By order,

J. Lindley,
Sanitary Inspector.

Market Place, Batley.

During March, Messrs. P. S. King and Son, of Orchard House, Westminster, will publish a new edition of Mr. W. Walter Crotch's book on "The Cottage Homes of England." The book has undergone a complete revision, and will contain a considerable amount of new matter.

INLET VENTILATION.

The occurrence in this country of three deaths from poisoning or suffocation by gas burnt in insufficiently ventilated rooms, within the period of two months, has once more brought the question of ventilation to the public notice. In last week's *Engineer* there appeared a valuable article on the subject, in which the need for inlet ventilation is clearly set forth. After enumerating the circumstances of the three fatalities, the writer goes on to say :—

It must be taken as a fundamental principle of hygiene that in bedroom, bath-room, dwelling-room, or kitchen, each and every gas stove must be fitted with an arrangement which carries the products of combustion into the outer atmosphere. Even the "practical man" never ventures to deny this proposition in plain language. He only protests that a spare chimney of the house is not always available in the corner of the room where the stove or boiler is to be placed; that if he erects a flue, sometimes it will not work; therefore, forsooth, it is better to omit the flue altogether, and request the user to open his window top and bottom. If he does not want to open his window, let him put in an outlet ventilator, and trust that the wind will never blow it shut at the critical moment. Of course a short flue designed and erected by an ignorant amateur or a rule-of-thumb workman does not always produce the desired up-current of air; sometimes it yields a distinct down-draught, more often it is almost idle. To design a trustworthy ventilating shaft outside a tall house with other houses close at hand, with sloping roofs in all directions, with currents of air and wind blowing in different ways at the same time, is a matter requiring much skill; but it can be done. Occasionally the difficulty is really to prevent an actual downward current of air in the chimney, for this may be determined by a variety of circumstances. The flue may act as the short leg of an inverted syphon, of which one of the brick chimneys of the house is the long leg. Sometimes the long leg may be the well staircase of a lofty building. Much more frequently the flue is merely inoperative because, although it works satisfactorily as the long leg of a syphon when it is given a fair chance, when the doors and windows are closed, no alternative short leg —no air inlet that is—has been provided.

A striking illustration of the way in which the central staircase or lift-well of a tall block of offices or flats will sometimes act as a regular exhaust shaft to the whole building has come under our notice at the moment of penning these lines. It occurs in a well-known spot in central London where the house contains four or five floors of offices. When the tightly-fitting swing doors leading from the street into the main hall are closed, the current of air rising through the stair-well is sufficiently powerful to overcome the up-draught of any chimney heated by an open coal fire on the ground floor; and when the door leading from the inside hall to one of the offices is opened, all windows in that office being shut, the suction of the staircase draws air and smoke down the private chimney, through the office, out of the door, and up the public staircase. When the hall-to-office door is closed, the fire burns and the chimney draws sufficiently well; presumably because the "vacuum" in the room is so high that air is sucked in even through the well-fitting window frames; but immediately that door is opened the line of least resistance is in the direction we have described. This is a case of what may be termed illegitimate down-draught. The private chimney of itself is not so faultily designed as to yield a natural downward current, it is only damped at the base by absence of inlet ventilation; but when it is placed in connection with a more powerful exhausting machine, of necessity it succumbs to the action of its stronger rival. It should be observed that a well staircase tends to produce opposite effects at the bottom and at the top of a tall building such as we have been discussing. Its exhaustive properties cause it to damp or overcome the power of the chimneys of the lower floor rooms; near the roof it often assists the chimneys by helping to drive air into the several apartments ready for the private flues to extract. Downstairs it produces a negative pressure, upstairs it produces a positive pressure, which have to be added algebraically to the pull of the individual chimneys.

If the reader will turn to those technical journals which make a special point of answering questions and teaching elementary applied science, in almost every issue now-a-days, he shall find an inquiry as to why a certain chimney or flue will not draw. It may be the chimney of a coal fireplace; it may be the flue of a gas stove. In nearly every instance the inquirer describes the trouble as down-draught; in nearly every instance his own words show it to be nothing of the kind. The replies, when they are given correctly, are almost invariably couched in identical terms: Your chimney does not draw because you have not put an inlet ventilator in your room. You cannot extract foul air from a closed apartment if you do not replace it by an equal volume of fresh air. The point is rudimentary; but we are compelled to affirm that it is one which has been overlooked by many architects and ventilating engineers in the past.

Hitherto the bulk of our population have lived in single, low, £40 or £50 town houses, each with its own front door and hall, with light and badly-fitting doors and window frames, with floors cramped together of green wood which quickly gapes into wide openings. However much the occupier strives to produce a vacuum in his rooms, he cannot succeed; in spite of his best endeavours air enters the various cracks and crevices of his house to an extent which defeats his involuntary attempts at suicide, and keeps him in good health. Now there is a move to lofty flats, better and more stoutly built, with doubly or trebly inclosed halls, with no shaft-like staircase inside the private dwelling, with well-constructed door and window frames. When the windows are shut, each flat is practically closed against the atmosphere except through the chimneys of its several rooms; and when the servants light the kitchen fire, the fresh air which it needs is drawn down the chimney of an adjacent room. A gas stove in the bed or sitting-rooms, or a geyser in the bath-room connected into a chimney, will not pull against a dwelling-room coal fire, or the stronger draught of the kitchener; and there is a downward current of air or, as the case may be, of air plus combustion products, because the cooler chimney acts as the short leg to the long leg of the hot one. Here again the cure is obviously an inlet ventilator. Much skill and thought, however, are needed in fitting such; for unless they are placed in the proper situations, and the currents of fresh air are most carefully broken up and deflected, they produce a gale of wind which is unbearable and fraught with danger to health.

THE INSTITUTE OF SANITARY ENGINEERS

(Incorporated).

OFFICIAL TRANSACTIONS.

The following meetings will be held on Wednesday, March 13th, 1901 :—

Examination and Literary Committee at 3 p.m.

General Purposes and Finance Committee at 4 p.m.

Election Committee at 5.15 p.m.

Members' Sessional Meeting at 7 p.m.

March 22nd and 23rd, Examination in Practical Sanitary Science.

HULL'S NEW DISINFECTING STATION.

The formal opening of the new Hull disinfecting station and the laying of the foundation stone of the projected West district destructor took place on February 20th, in the presence of a large gathering of the Corporation officials and the general public. The Mayor (Alderman Gelden), accompanied by members of the Corporation, drove from the Town Hall to the site of the new destructor, where a special platform had been erected, and the scaffold poles decorated with flags and bunting.

It was in October, 1899, that the City Council sanctioned the erection of the proposed station on a site covering a ground area of 3000 square yards, situate in West Dock-street, at a cost, including furnishing, of £5000. The station is isolated and easy of access, and is provided with waiting-rooms, bath-rooms, &c., containing accommodation for both sexes, to which persons who have been exposed to infection can be removed for the purpose of bathing and the disinfection of their clothing. Formerly the disinfection of bedding and articles of clothing was carried out at the municipal infectious diseases hospitals, with apparently no danger to the public health. The demolition of the Garrison Hospital, however, necessitated the provision of further suitable accommodation. The arrangements of the station are such that, where advisable, families and those who have been engaged in nursing the sick may be removed for bathing and the disinfection of their clothing, and may also be isolated in the shelters attached to the station. The station will prove a great advantage to the Port Sanitary administration, as should a vessel arrive in the port with infectious disease on board, in addition to the infected person being removed to hospital, the whole of the ship's crew and effects may be removed to the disinfecting station, whilst the ship itself is undergoing disinfection. It is considered by the Sanitary Committee that the appliances and equipment for disinfection in Hull should be as complete as scientific knowledge admits. The disinfecting station contains an apparatus known as the "Washington Lyon," of the latest design, and on the most modern and approved principles. All the most important requisites of a disinfecting station are provided, the accommodation being as follows:—Disinfection block (clothing, &c.): Receiving-room, discharging-room, disinfecting chamber for cabs, operatives' bath-room, sanitary convenience, tool store, wash-house, and boiler-house. Disinfecting block (personal): Two waiting-rooms for males, two waiting-rooms for females, two bath-rooms for males, two bath-rooms for females, two dressing-rooms for males, two dressing-rooms for females, two (discharged) waiting-rooms for males, two (discharged) waiting-rooms for females, office, sanitary conveniences, and night shelters (ten beds). Stables, &c.: Three-stall stable, harness-room, manure pit, and three cab-sheds. The Sanitary Committee have determined to take over the whole of the ambulance arrangements in connection with the removal of persons to hospital, and of infected bedding, clothing, &c., for disinfection, and its return home after completion; also for the conveyance of patients to hospital and their return home after convalescence. Adequate accommodation has been provided at the station for the stabling and sheltering of the necessary horses and ambulances used for the purpose. Houses have been erected for the superintendent and horsekeeper, who will be available at any hour in cases of emergency to undertake the removal of patients to hospital, disinfection of clothing, &c. To comply with the provisions of the Infectious Diseases (Prevention) Act, 1890, it is compulsory, on the completion of the patient's convalescence, that the house or part thereof, and all articles likely to retain infection, shall be disinfected to the satisfaction of the Sanitary Authority. The completion of the disinfecting station fulfils a long-felt want, and its complete equipment is a great adjunct to the sanitary administration of the city.

The destructor, which is of the Horsfall type, will have twelve furnaces, each capable of destroying ten tons every twenty-four hours. The carts will be raised by means of a steam hoist to an upper platform, where they will be tipped, thus overcoming the necessity of drawing heavy loads up a steep incline, as in the case of the existing destructor at Chapman-street. An incline will be provided for the return of the empty carts. Two water-tube boilers of Messrs. Babcock and Wilcox's manufacture will be provided, and, if necessary, there will be room to fix two others. It is intended to supply steam to the disinfecting station and also to the hoist. The building will be large enough for four additional furnaces, making the total number sixteen.

ISOLATION IN RELATION TO TYPHOID FEVER.

There can be no doubt that the most important step to be taken at the present time for the prevention of typhoid fever is to provide for the removal to hospital of all patients who cannot be properly isolated at home. The need for a larger number of removals is clearly shown from the fact that 244, or about two-thirds of the cases were treated at home in the past quarter. Moreover, 101 of the cases treated at home lived in houses with two bedrooms and one living-room only, and a number of these houses contained as many as seven other persons besides the patient.

The effect of removal to hospital is very great in preventing further cases in the same house and among the patient's friends and relatives. But it is also most noticeable in increasing the patient's chance of recovery. Thus, in the quarter under review, of the patients treated in hospital only 12 per cent. died, while 24 per cent. of the cases treated at home succumbed to the disease. This is not surprising when it is remembered that a great many cases occurred in the homes of the poor, where skilful nursing, suitable diet, and good hygienic surroundings are not generally available.—Alfred Hill, M.D., M.O.H., Birmingham.

British Congress on Tuberculosis.—This Congress, which is to be held in the Queen's Hall, Langham-place, in the week beginning July 22nd, 1901, has arranged, amongst other matters, for three public addresses to be delivered in the Large Hall on Tuesday, Wednesday, and Thursday of that week. The first will be given by Professor Robert Koch, of Berlin, discoverer of the tubercle bacillus; the second by Professor Brouardel, of Paris; and the third by Professor McFadyean, of the Royal Veterinary College.

Holiday Children.—Mr. J. P. Humphrey, Sanitary Inspector to the borough of Reigate, says:—"The attention of the department has been forcibly drawn to some cases of overcrowding which have occurred through the occupiers of cottages, who already have families of their own, receiving holiday children who have been sent from London by various philanthropic associations. It is doubtful if a child receives any permanent good by fresh air received in the day if compelled to sleep in a fœtid atmosphere during the night. There is also a risk of infectious illness being imported into the borough by these children, and it seems desirable that there should be some system of notification to the Local Authority by the associations in question of their intention to send such children out, and the intended destinations. Attention should be given as suggested by the magistrates, that they should always be under proper supervision."

ANNUAL REPORTS.

Clackmannan.—The tenth annual report by Dr. Nasmyth upon the health and sanitary condition of the county and burghs of Clackmannan has been issued. The county water scheme, it is stated, is not yet completed, but the temporary supply has been a great boon. During the year there were 59 cases of infectious diseases reported, as compared with 45 the previous year. There were 334 births and 168 deaths, giving a birth-rate of 26·6, and a death-rate of 13·5 per 1000 of population. Dealing with the burghs, Dr. Nasmyth states he knows of no busy commercial town in so sanitary a state as Alloa. Alva is favourably reported upon, while it is stated of Dollar that the general state of the burgh is good. For Tillicoultry improved storage for water to provide against dry summers is recommended.

Craven.—Dr. Atkinson, M.O.H. to the Joint Committee of the combined districts of Craven, has distributed copies of his annual report to the Council. A summary of statistics for the past year was given in the report in tabulated form, and showed that the rateable value of Settle for 1900 was £143,682, and the estimated population 14,340. The total births for the year numbered 346, equal to a birth-rate of 24·1 per thousand of population. Total deaths numbered 191, which was equal to a death-rate of 13·3 per thousand. The percentage of total deaths under one year was 16·2, and per 1000 of registered births 89·5. The percentage of total deaths under five years was 21·9, and over sixty-five years 20·9. The zymotic death-rate per 1000 was 0·3. The Doctor alluded to these figures as being satisfactory. The death-rate for England and Wales during 1900 was 18·3 by which Settle's 13·3 compared favourably, whilst the zymotic death-rate for England and Wales was 2·0. Settle's zymotic rate, as they would see, was 0·3, which was the least of the whole of the other districts of Craven, with the exception of Sedbergh, which was 0·0.

Sunderland.—Dr. Scurfield, Medical Officer for the Port of Sunderland, has just issued his annual report. From it we learn that twenty-four ships entered the port with sickness on board during the year 1900, which is not a large number when it is considered that 5777 vessels in all entered. Of the cases reported only three were of an infectious nature, viz., one enteric fever, one scarlet fever, and one small-pox. The total number of vessels entering the port was a decrease of 139 on that of the preceding year. Those engaged in the coasting trade numbered 4097, and in the European trade 1293, while 96 were trading beyond Europe. The gross tonnages of the vessels amounted to 2,633,937 registered tons. Of the total ships which entered the port 2751 were inspected and reported upon by the Inspector to the Port Sanitary Committee. On these vessels there were 37,080 sailors living, compared with 37,366 in 1899. The average number of men in each ship last year was 13·5; in 1891 it was 12·7. Of the 2756 vessels inspected, 95, or 3·4 per cent., were found to have one or more sanitary defects. The nuisances consisted of 38 foul or dirty forecastles or living places, and 57 foul conveniences. In every instance the nuisance was abated on the notice of the Inspector, no legal proceedings being necessary. The British ships show an insanitary percentage of 2·1 less than last year.

Thedwastre.—At the last meeting of the Distrfct Council the Medical Officer of Health (Mr. A. Butler) presented his annual report on the health of the district in 1900. The number of deaths registered was 124, or 13 per 1000; the number registered during 1899 was 111, or 11·6 per 1000. The number of births registered was 241, or 25·3 per 1000, and the number registered during 1899 was 250, or 26·3 per 1000. The infant mortality, or deaths, occurring under one year of age, was 10, as compared with 21 for the previous year. No death had been reported as occurring from zymotic causes during the year. Ten deaths were caused by phthisis, as compared with six during the year 1899, and seven during the year 1898. This, though a slight increase, compared favourably with most districts in England. During the year he had received 29 notifications of infectious diseases, as compared with 34 for the year 1899. This was a small decrease, but might have been still further reduced had the district been provided with an isolation hospital. Ten cases of scarlet fever were reported, as compared with 22 for the previous year, nearly all the cases occurring in the parishes of Beyton and Hessett. Five cases of diphtheria were reported, all of which occurred in one house. In one parish, Hessett, with a population of 353, there had been no deaths, while at Drinkstone, with a population of 390, there had been only one death, and the same was the case at Gedding, with 92, and Felsham with 374.

INSANITARY ESSEX.

The sanitary condition existing in the Maldon district of the county of Essex, despite the energetic measures taken by the Medical Officer of Health, Dr. Thresh, still continues to leave much to be desired. The district contains a large number of very old cottages, difficult to maintain in habitable repair. These do not improve as years roll on, and each year sees a certain number voluntarily closed by the owners as being beyond repair. Most unfortunately very few new ones are being erected, as they cannot be built at such a price as to render the investment remunerative. A certain amount of overcrowding certainly exists, but very few cases occur in which the Council can interfere, although there are very many families living under conditions which must efface all trace of modesty, and conduce ultimately to immorality, if not to actual crime.

Many nuisances arise from cottages having been erected on pieces of roadside waste with little or no ground at the rear. The privies and ashpits have to be very near the cottages. By more frequent inspection, and by the substitution of pail or earth closets for the old privies, great improvements have been effected, but the condition still leaves much to be desired.

The general condition of many of the private wells is far from satisfactory, chiefly arising from imperfect construction, defective pumps, want of paving around, or of a drain to carry away the waste water, and from being placed in gardens which are highly manured, often with human excrement, &c. Very few of them yield a water which can be considered pure and safe, yet it is often impossible to obtain a better supply. For example, at Tolleshunt Major an attempt was made to obtain a supply which should be under the control of the Council, but the site selected yielded a very impure water, and the only good water is a small spring or private pond at one end of the village. Possibly this may be utilised. At Ulting a scheme was mooted for piping a spring to the principal group of houses, but has not yet been carried out.

More care is exercised in connection with the supplies to new houses before a certificate for occupation is granted; but it is worth consideration whether a better construction should not be insisted upon. Dr. Thresh thinks that with a very little additional expense it would be possible to decrease the risks of pollution. Glazed earthenware cylinders might be substituted for

the dry steyning, the top should be properly domed over and be made water-tight, and the suction pipe be flanged and so inserted as to prevent surface water gaining access along the track of the pipe. A code of regulations could be drawn up, and an intimation given to each person sending in plans that the water supply would not be considered satisfactory unless the regulations were complied with.

Accumulations of refuse are very common, few houses having any kind of receptacle for ashes or house refuse, save in the more populous parishes, such as Heybridge, Tollesbury, and Southminster, where a public scavenger is employed. The usual plan is to throw the refuse into a hole dug in the garden. If this hole were at a distance from the cottage, and a little earth were sprinkled over occasionally, this mode of disposal would rarely cause a nuisance, but too often the hole is at the nearest point to the back door, and serves as the receptacle for liquid slops as well as ashes. Attempts are made to educate the people by recommending them to use the dry ashes for covering the excreta in the pails or cesspits, and to distribute the slops uniformly over the garden, but ease is considered before health, and the present existing insanitary conditions are likely to continue. Slaughter-houses and bakehouses are found generally in fairly satisfactory conditions. Cowsheds vary very much. The more modern ones are satisfactory, but some of the older ones leave much to be desired. Dr. Thresh hopes the introduction of the new water supply will lead to improvements.

THE SURVEYORS' INSTITUTION.

The annual dinner of the Surveyors' Institution was held on Monday evening at the Holborn Restaurant. Mr. John Shaw, the president, occupied the chair, and among those present were Sir J. Wolfe-Barry, Sir J. F. L. Rolleston, M.P., Sir Alexander Binnie, Mr. A. de Bock Porter, Mr. Daniell Watney, Mr. J. L. Wilkinson (general manager, Great Western Railway), Mr. D. J. Ross (City Engineer), Mr. Arthur Vernon, Mr. J. F. F. Horner (Commissioner of Woods, &c.), Mr. G. M. Freeman, K.C., Mr. R. Ellett (president Incorporated Law Society), Mr. C. J. Owens (general manager, London and South-Western Railway), Mr. Andrew Murray (City Surveyor), Mr. J. H. Sabin, Mr. T. M. Rickmann, Mr. W. A. Flaxland, Mr. J. C. Rogers (secretary), and Mr. J. W. Penfold (hon. secretary). Lord Brampton and Mr. Justice Grantham were prevented by illness from being present.

After the usual loyal toasts had been duly honoured, the Chairman proposed "The Houses of Parliament," to which Sir John Rolleston replied. Sir J. Wolfe-Barry then submitted "The Legal Profession," and Mr. G. M. Freeman, K.C., and Mr. R. Ellett responded.

In proposing the toast of the evening, "The Surveyors' Institution," Sir Alexander Binnie (Chief Engineer of the County Council), said that his profession was very intimately connected with that of the surveyors. He looked upon their organisation with pride and pleasure. It was a young institution, but was rapidly growing, and its members had appreciated what was absolutely necessary for the growth of any profession of that kind. They had established themselves, and had determined, by their influence, that their profession should be kept up to the highest mark which was possible in an advanced age like the present. They had established a library, which was the backbone of any institution.

The President said, in reply, that he did not think the public generally were aware of the position of the Institution at the present time. When it was started years ago, the first report being published in 1869, there were 200 members. The last report, published in 1900, showed a membership of between 3000 and 4000, and he was happy to say the number of members was still increasing. The accounts were in a most satisfactory condition, and after paying off the debt in connection with the new building in Great George-street, the outlay having been £31,000, there were considerable balances, The library now contained something like 8000 volumes. In regard to their Benevolent Fund, which was proposed two years ago, there was £7100 invested. He hoped that the Institution would in future continue to benefit all surveyors, and particularly young surveyors. Other toasts followed.

CORRESPONDENCE.

(*To the Editor of* The Sanitary Record.)

(*We do not in any way hold ourselves responsible for opinions expressed by our correspondents.*)

A GOOD RECORD.

Sir,—The following facts may interest you and your readers. The borough of Batley is a manufacturing town with a population of 32,000. For the whole year 1895 not a single death occurred from measles or scarlet fever. For the whole year 1896 not a single death occurred from diphtheria. For the whole year 1899 not a single death occurred from measles, and only two deaths occurred from scarlet fever. For the whole year 1900 not a single death occurred from scarlet fever.—Yours faithfully,

Batley, March 1st. Observer.

A CORRECTION.

Sir,—In the abbreviated report given in this week's issue of your journal of the meeting of the National Union of Sanitary Inspectors held at Oswestry, it is stated in reference to the bacteria beds that in albuminoid ammonia 80·5 per cent. of purification is effected. This should be 89·5 per cent.—a marked difference. I shall be obliged if you will kindly correct this in your next week's issue.—Yours faithfully,

Oswestry, March 1st. G. William Lacey.

THE REEVES SYSTEM OF SEWER VENTILATION.

Sir,—In your issue of January 17th you allow a reference to the Reeves system, in a report by Mr. H. Gilbert Whyatt, the Grimsby Borough Engineer and Surveyor, which I am persuaded is purely the result of an inadvertence so far as you are concerned. You will be able to judge of the untenableness of Mr. Whyatt's position in more ways than one from the enclosed correspondence, which has appeared in the *Public Health Engineer*, and which, with your usual fairness to both sides of a question, you will, I have no doubt, publish in your next issue, and thereby put your readers also in possession of the facts.—Yours faithfully,

17, Victoria-street, S.W., Wm. Brown.
March 2nd.

[copy.]

Sir,—My attention has been called to the short letter of Mr. W. Brown in your issue of January 5th. I regret that, owing to pressure of business, I did not read that issue so carefully as I might have done, and did not see it at the time.

Mr. Brown calls upon me to make good my statement as to the expense of the "Reeves system" of ventilation preventing its use being maintained for any lengthened period.

My statement was made from my knowledge of the customs of many Local Authorities in this country. A new installation (for any purpose) recommended to them is

adopted by them after full inquiries, and, as long as the Local Authority consists of the same gentlemen, is maintained regularly. In the course of a few years the composition of the Council changes; "A new king rises who knew not Joseph," a reign of economy sets in, the use of the installation is suspended for a time, and probably is never re-commenced. This applies generally to works which are out of sight (and therefore out of mind), and sewer ventilation is no exception to this rule.

I estimate the cost of a "Reeves" installation somewhat as follows:—First, there will be the alteration of the manholes, which may be anything from £5 to £10; the cost of apparatus is £10; making an initial cost for each manhole from £15 to £20. Then comes the cost of maintenance. The cost of chemicals is from £2 to £3 per annum; the cost of water spray will vary according to its local price, and may be anything from 3d. to 1s. per 1000 gallons, which works out at £3 to £12 per manhole per annum. In addition to this, there are the wages of the attendant, which will, of course, be in proportion with the number of manholes fitted up and the number of days per week that it occupies his time. Assuming that each manhole requires two hours' time per week, this will represent 104 hours per annum, or, say, £2 10s., making the annual cost per manhole from £7 10s. to £17 10s. Supposing that the Local Authority has put down ten installations, it will easily be found what a great temptation it will be to economise in this direction rather than in any other.

From the accounts that I have received of the efficiency of and the quantity of air purified by the "Reeves" system, I came to the conclusion, as I said in my report, that the system was effective; but there is no reason to withdraw my statement that Local Authorities are not likely to maintain its use for any lengthened period, for the reasons above stated.—Yours, &c.,

H. Gilbert Whyatt,
Assoc. M. Inst., C.E., M. San. Inst.,
Borough Engineer and Surveyor.

Borough Engineer and Surveyor's Office,
Town Hall, Grimsby, February 14th, 1901.

Sir,—Referring to Mr. Whyatt's letter to you in last week's *Public Health Engineer*, the objectionable passage which Mr. Whyatt sees no reason to withdraw from his report on sewer ventilation, for reasons he mentions, is: the Reeves methods "are so expensive that no Local Authority is likely to maintain them for any lengthened time." But the reasons will not stand inspection. They consist of two crude generalisations, and the first thing a student of this sewage disposal problem has forced upon him is that generalisations—even such as are not crude—are not to be too much relied upon. Mr. Whyatt's first generalisation is vague and improbable, and his second is vague and inaccurate. The first—the reference to the Joseph incident—to have any force at all, Mr. Whyatt must prove that Local Authorities have no proper interest in the life and health of the public who entrust them with the important duty of seeking out and maintaining those methods which are proved to be beneficial to the public health. By the Reeves system perfect sewer ventilation can be guaranteed absolutely. That is, under all atmospheric conditions no fouling of the air in sewers is allowed to take place. It is not at all a likely thing, therefore, that this system, once installed, and its benefits proved, any change in the *personnel* of any Local Authority would have the result of which Mr. Whyatt is so apprehensive. The officers of the public health service would have something to say before that would be allowed to happen. As to the second generalisation, which Mr. Whyatt calls "an estimate of the cost of a Reeves installation"—meaning thereby an apparatus, and not the Reeves system as a system—its equal lack of force will appear presently.

It is necessary now to explain that, no reply being made to my letter to you, appearing in your issue of January 5th, but, instead, Mr. Whyatt's report, with the same objectionable clause repeated, appeared in The Sanitary Record of January 17th, I wrote direct to Mr. Whyatt, and a correspondence ensued, in the course of which I put him in possession of certain facts about the Reeves system which I then hoped would have been used by him as a golden bridge to retire from the false position he had taken up.

I give below a summary of these facts:—

(1) That Mr. John Cooper, the Burgh Engineer for Edinburgh, reporting to his Council on the year's work of his department, in a section dealing with the question of sewer ventilation, makes the following reference in recommendation of the Reeves system: "I have to confess that after prolonged investigation I can, meantime, recommend no more effective system than that of Reeves. . . . Shafts tall or otherwise, will not be tolerated in the public streets or erected against houses."

(2) That on the basis of figures given in a paper read by one of Mr. Cooper's assistants at the meeting of the Municipal and County Engineers, Edinburgh, 1898, Mr. Reeves had shown that his system was capable of purifying a volume of sewer air equal to 4,500,000 cubic feet for 1s. 6d.

(3) That we can point to a case where we would be prepared to install our system, keep it going for twenty years, and pay ourselves out of the money at present spent on flushing the sewers, without getting adequate ventilation, and at the end of the twenty years hand the installation over to the Local Authorities without any further payment, and during the twenty years we would give an absolute guarantee against any pollution of the sewer air.

(4) That the cost of applying the Reeves system to all the sewerage of the urban populations in the United Kingdom, say 20,000,000, would not exceed £150,000 annually, including interest and repayment of capital—a small sum, comparatively, to the cost of the vaccination service alone.

(5) That the cost of maintenance of a Reeves apparatus depends entirely upon the work it has to do. In the case of Edinburgh the cost refers to severe conditions, while there are other cases where the cost is only a few shillings per apparatus per annum. Similarly, with regard to cost of installation, it may range from £5 per apparatus up to a considerable sum.

Mr. Whyatt had all these facts before him when he wrote you that he did not see any reason to withdraw his objectionable reference. It is to be hoped that he sees what he owes to himself a little more clearly now.

I see that Messrs. Stone in their letter to you, also in last week's number, make a statement which I commend to Mr. Whyatt's attention. It shows how much importance a firm of standing and experience attaches to a question which Mr. Whyatt would seem to treat as of minor importance. Messrs. Stone say:—"Of course, if Mr. Reeves really can do this (viz., purify 4,500,000 cubic feet of sewer gas . . . at a cost of 1s. 6d), then we have nothing further to say, except to express a hope that his system may soon be universally adopted, but the claim appeared to us to be so very absurd that we did not think it necessary to attempt to refute it."

Now, within the limits of Mr. Reeves' calculation, this claim is quite legitimate, and I presume that Messrs. Stone no longer see any absurdity in it. Mr. Whyatt will at least admit the cogency of this point. He must be familiar with the figures on which it was based, which were published in the "Transactions" of Municipal Engineers, the technical Press, and Colonel Moore's "Sanitary Engineering," and have never been disputed. Indeed, Mr. Whyatt goes as far as to say:—"From the accounts I have received of the efficiency of and the quantity of air purified by the Reeves system, I came to the conclusion that the system was effective."

If, therefore, Messrs. Stone have any doubt remaining as to the possibilities of the Reeves system, I commend them in turn to Mr. Whyatt.

Your readers, I am sure, will readily appreciate the value of such evidence. Neither witness can be suspected of being biassed in our favour, at least for the moment, although I feel sure that fuller knowledge would bring about a better understanding between both opponents and ourselves.

The error which Messrs. Stone have fallen into as to the quantity of sewer gas generated in London in twenty-four hours, and which, strangely enough, they make in two separate letters, does not affect Mr. Reeves' calculation in any way. It is clear from the context that both parties are dealing with the same substance, viz., not the gas generated from the sewage, which has been calculated at about 3,000,000 cubic feet, but the air polluted by such gas in all the varying proportions in which it may occur in a sewer at any particular time.—Yours, &c.,

Wm. Brown,
Managing Director, Reeves Chemical Sanitation, Ltd.,
17, Victoria-street, S.W., February 26th, 1901.

MUNICIPAL ENGINEERING & SURVEYING.

CROSS-TABLE CHAT.

It is singular that there should be such a very erroneous and vague notion amongst those who, it might be supposed would have known better, that all coal gas is more or less of the same lighting value, and that gas which is supplied at, say, 2s. 6d. per 1000 cubic feet, is universally considered to be, without a shadow of doubt, cheaper than gas at, say, 4s. per 1000 cubic feet. As a matter of fact, however, if gas at the latter price be of higher quality or illuminating power than that supplied at the lower price, it may be much cheaper to the consumer. Mr. W. J. Dibdin, F.I.C., F.C.S., the well-known analytical chemist, and formerly chemist and gas examiner to the London County Council, than whom—as pointed out the other day by Professor Percy Frankland in the discussion which followed the reading of a paper by Mr. Dibdin on "Coal Gas: Effect of Quality on Consumption," at the Society of Chemical Industry—"probably no one living had had so much practical experience of the illuminating power of gas, how it was developed, and on what principle burners should be constructed," has conducted a series of valuable and exhaustive experiments showing the effect of variations in quality upon the quantity of gas required to give normal illumination.

For the purpose of the experiments different qualities of gas were obtained and connected to a photometer. The quality of the gas was first carefully tested when burnt at the rate of 5 cubic feet per hour in a No. 1 London Argand burner for its illuminating power, and then burnt in various gas burners in succession, making photometrical determinations of the light and estimations of the quantity of gas consumed.

In this way it was ascertained that with a flat flame burner of recognised efficiency, viz., Sugg's table top No. 4, which gave 14·4 candles of light with 5·3 cubic feet per hour of 16·2 candle gas required to produce the same illumination, 6·1 cubic feet per hour, when the illuminating power of the gas was reduced to 15·2 candles; 6·4 cubic feet with 14·2 candle gas; 7·75 cubic feet with 13·5 candle gas; 9·7 cubic feet per hour with 12·2 candle gas, and 11·2 cubic feet per hour with 11·2 candle gas; whilst when the quality of the gas was raised to 17·2 candles the consumption required to yield the same unit or normal lighting power of 14·4 candles was reduced to 4·5 cubic feet per hour, and with 19·2 candle gas the consumption was only 3·9 cubic feet per hour.

Interpreting the variations in consumption of gas into relative cost, it was found that to obtain equal degrees of illumination with varying qualities of gas with a well-known burner—Bray's No. 4—the actual cost of gas to the consumer, on the basis of light for money, would be as follows:—

Illuminating power of gas.	Quantity of gas required to give light equal to 1000 cu. ft. of 16·0 candle gas. cu. ft.	Actual cost of gas at 2s. 6d. per 1000 cu. ft.
19·0	600	1 6
18·0	700	1 9
17·0	820	2 1
16·0	1000	2 6
15·0	1340	3 4
14·0	1800	4 6
13·0	2400	6 1
12·0	3040	7 9
11·0	3750	9 6

From this table it will be seen that, with a fall in the quality of the gas of 2 candles—say, from 16·0 candle-power to 14·0—the cost of obtaining a fairly uniform light to the consumer is nearly doubled; and with a further fall of 1 candle-power — *i.e.*, to 13 candles —the cost is 6s. 1d. against 2s. 6d., a circumstance which explains the otherwise inexplicable rise in consumers' gas bills which is so common in districts where the quality of the gas is variable. It is, therefore, plainly evident that comparisons in the cost of gas in different districts are absolutely valueless without a recognition of the *quality* of the gas in each case, for if a larger quantity of low-power gas has to be consumed to obtain a sufficient or equal light to that of a higher-power gas at a higher price, the latter may be much cheaper to the consumer.

These facts are of great importance, especially so to municipal engineers, whose duty lies in ensuring that gas companies who contract for the lighting of public lamps fulfil their contract and give the quality of gas required. It is also a fitting commentary on the necessity of Parliament prescribing the illuminating power of gas which has to be supplied by companies to the public, who require to be protected against the cupidity of many of those whose directors look upon consumers as dividend-earning machines. A considerable number of municipal engineers and surveyors are required to enforce contracts for street lighting. This, however, cannot be done, unless the Local Authority possess a photometer. Such experiments as those conducted so ably by Mr. Dibdin show how extremely necessary it is that without such an apparatus both they and the public are likely to be deceived, and it is to be hoped that the lesson will not be lost. Senex.

YELLOW FEVER IN CUBA.

One of the great advantages which sanitarians hoped for when the United States obtained control over Cuban affairs was the opportunity which would be thus presented for such a cleansing of the city and harbour of Havana as would diminish, if not entirely exterminate, that dread scourge of the tropics, yellow fever. And yet, though the city is cleaner now than it has been in fifty years, still the fever is unusually prevalent. The season which has been regarded as especially conducive to its development is the rainy season; this year this has been almost entirely absent, dry weather having replaced the usual wet weather.

The increase has been accounted for according to some by supposing that it is an apparent, not a real increase, the returns hitherto having been very incomplete; and further, by the fact that an increased number of immigrants have arrived at Havana this year. It is gratifying to note that Santiago is practically free from the disease.

The theory, advanced by Dr. Finlay, of Havana, that the bites of insects, fleas, and mosquitoes, propagate yellow fever is now receiving marked attention, and the observations of Dr. Reed and other physicians of the U.S. Army are strongly confirmatory thereof.

Surgeon-General Sternberg sent to Cuba last summer a commission consisting of Major Walter Reed, Surgeon U.S.A., Drs. James Carroll, A. Agramonte, and Jesse W. Lazear, acting assistant surgeons, U.S.A., to investigate yellow fever. Of this commission, Dr. Carroll was bitten by a mosquito August 27th, taken sick August 31st, and went through a severe attack of yellow fever.

Dr. Lazear was bitten August 16th by a mosquito from a mild case of yellow fever, without serious result. He was again bitten September 15th, and died of yellow fever September 25th.

The mosquitoes used were raised from the eggs in tubes, allowed to bite patients suffering from yellow fever and then permitted to bite Drs. Carroll and Lazear, both of whom volunteered for the purpose. If there is any instance of devotion to science more conspicuous than this, we are ignorant of it.—*Brooklyn Medical Journal.*

NOTICES.

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The Sanitary Record
AND
Journal of Sanitary and Municipal Engineering.

MARCH 7, 1901.

SANITATION IN HIGH PLACES.

THOUGHTFUL men have long since refused to subscribe to the dictum that the "King can do no wrong," and yet there are many details of the administrative life of Government departments which would point to the conclusion that, while they make laws and regulations for others, they refuse to be bound by such restrictions themselves. We are among those, however, who refuse to believe in the infallibility of any human organisation, or to admit that any branch of public life should be freed from the safeguards deemed essential to the health and well-being of the general community. The private manufacturer must see that his factory is suitable for the accommodation of his workpeople. Not only has he to satisfy the Factory Inspector, who represents the central government, but he must conform to the regulations of the local authorities in all matters pertaining to a proper sanitary condition of his works. In fact, in the metropolis, he has a double test to satisfy, the Borough and County Councils. The Government departments, however, claim exemption from the jurisdiction of these bodies on the ground that their needs are looked after by the Office of Works. But is this office properly equipped for the work it is supposed to carry out? Of course it has its political head, its permanent officers, and its prescribed number of clerks, but there is nothing in its constitution to qualify it for the responsibilities which such an office should undertake. It is not sufficient that those who work in Government offices should be put into fine buildings; the exterior may be of the most ornate architecture, but the interior may be little better than a pest house if the elementary principles of hygiene are totally ignored or only superficially attended to. Clerks in high places have quite as much right to consideration as artisans and girls in factories, and it is because we believe that the staff of the Office of Works, as at present constituted, is not capable of ensuring this needed protection, that we urge the necessity for immediate reform.

That the Department has some doubt about its efficiency recent events may be taken as a proof. Many have been seeking for the reason of the appointment, announced a short time ago, of Dr. Corfield to the position of Consulting Medical Officer of Health to the Office of Works. That the appointment of Dr. Corfield to such a post is a good one all will admit; but, in itself, it is either unnecessary or it does not go far enough. Thus, we have made it our business to try to become acquainted with the circumstances leading up to the new departure, and the evidence we have secured proves two things: first, the incompetency of the Department; and secondly, the need for supplementing the appointment of a Medical Officer with that of a sanitary expert—one who has a practical knowledge of the construction of drainage and other essentials for securing healthy buildings. A few months since there was an outbreak of what is known as one of the "preventable diseases" at the Foreign-office. The case came to the knowledge of the Prime Minister, who immediately asked that the Works Office should make an inspection of the drainage system. The request was complied with, and in due time a report was made that it was efficient and sound. It was therefore thought that the disease must have been contracted in "another place." But only a short time had elapsed when another victim was claimed in the same office. Again the Prime Minister insisted on an inspection, and again the report came forth that all was sound and perfect. But this time

Lord Salisbury was not satisfied, and on his own responsibility called in an independent expert. A fresh examination was made, and very soon it was discovered that "all was not well," but that the whole system of drainage at the Foreign-office was in a deplorable condition. The defects were so glaring that the youngest aspirant to the knowledge of sanitary engineering would have discovered them at once. Thus it is quite certain that the examination made by the department responsible for the condition of our public offices was either of the most perfunctory character, or it was made by someone to whom the principles of good drainage were an "unknown language." It was this episode that led to Dr. Corfield's appointment. But much as we admire this gentleman's abilities, and gladly acknowledge the high position he occupies in the ranks of Public Health Officers, we assert that his appointment is insufficient, and does not meet the requirements of the case. He should be supported by the selection of a thoroughly experienced and practical sanitary engineer, together with two or three first-rate assistants. If these additions were made to the present staff, and a free hand was given for an impartial and drastic inspection of all Government buildings, something like efficiency might be attained. Of course, we would prefer that the Government should bring itself into line with what it demands from others, viz., that its offices should be subject to inspection by the Local Authorities. But as it is not likely at present to do this, we insist that the officers named should be immediately appointed.

We are reminded that the Royal Palaces, too, are under the care of the Office of Works. Here, again, is it essential that expert advice should be sought. If the Department is so careless for the health of civil servants, what confidence can we have in it for looking after the welfare of the Royal Family? On these grounds, also, we urge the necessity for additional officers. Great alterations, we are informed, are contemplated at Buckingham Palace and Windsor Castle. The full extent of the work to be done is not yet finally decided, but it will be sufficient to warrant a complete overhauling of the sanitary condition of both places, and bringing it into line with modern ideas and practice. In all these matters the Government should set a good example to the nation. That the King and the Government should have "privileges" may be needful, but they should not include exemption from a compliance with those precautions necessary for the protection of their officers and servants from the ravages and attacks of "preventable disease."

The L.C.C. Elections.

For many reasons we are gratified at the result of last Saturday's polling for the election of members to the London County Council. It is a clear indication that a municipal spirit has at last been created in the great metropolis, and that the people desire the county to be governed according to its needs, and not the whims and fancies of political partisans. It is folly to think that because a man is Conservative in Imperial politics he is blindly to follow the same lead in regard to local affairs—more especially when the party man who seeks his suffrages is utterly devoid of any policy or idea of the work to be done by a County Councillor. Yet this is what he was asked to do in London, and the reply given is so emphatic that none can misunderstand it. Of all the daily papers, perhaps the *Daily Telegraph* most aptly and truly appraises the position when it says that the one clear "moral to be drawn from the elections is that the electors are in serious earnest in their demand for social reform and municipal progress." No one can say that we have bound ourselves to the Progressive party. We have never hesitated to approve of what we deem right in their proposals, or condemn what we think retrograde or unnecessary. But whilst there may have been some unwise steps taken within the past twelve years, the policy followed by the Council has worked for the improvement of the county and well-being of the people. It is the only body in the country which has seriously tried to grapple with the housing problem: its municipalisation of the tramways has been an emphatic success, for it has given better conditions of employment and wages to the servants, and worked wonders in the development of the system, the Council taking such action as will place it in the very front rank of electric traction within a comparatively short time—and all without adding one penny to the rates, but gaining nearly £50,000 per annum in relief of the same. Then there is the asylum policy, which has revolutionised the treatment of those suffering from the "mind diseased;" its improvement and addition to the open spaces; and many other things, the combination of which is gradually wiping out the stigma once resting upon London as being the least public-spirited and worst governed city in the kingdom. The electors of the County are not unmindful of this change, and their vote given on Saturday is a distinct mandate for a continuance of the policy of progress and reform. We trust also that the last has been seen of importing political spirit into the County Council, and that in future there will be a healthy rivalry displayed by the members in the promotion of the work. Let every question be discussed on its merits, and let it be frankly admitted that public improvements can seldom be carried out without first of all inflicting some cost upon the rates. If the new Council settles down to its work in this spirit, we may look forward to excellent results during the next three years.

The Collapse of the Water Companies' Proposals.

Last Thursday the Local Government Board inquiry into the proposals of the water companies of London for regulating the supply, &c., was brought to an abrupt conclusion. When the inquiry was about to re-open, Mr. Cripps, K.C., volunteered a statement. He defended the action of the companies in making the regulations, contending that they were only carrying out the

recommendations made by Col. Ducat and Mr. Barry in 1895, and endorsed by the more recent Royal Commission. But the Local Authorities did not view them in the same light; and in face of the opposition by these bodies, owing, the companies thought to misapprehensions of the objects aimed at, it was thought to be useless to go on with them, and he asked that the inquiry might not proceed further. It is a pity that this was not done before, for we do not remember any instance where the various Authorities of the metropolis have been so unanimous in their opposition. That this was so was well known before the inquiry opened. It may be, of course, that the objections "were founded on misapprehension," but here, again, the responsibility rests upon the companies. If the new regulations were only to be prospective, it should have been distinctly stated so. But they appeared to many to be open to another interpretation, and capable of inflicting unnecessary and heavy expenditure upon the ratepayers, and the Authorities were perfectly justified in protesting against their adoption. Further than this, sooner or later there will have to be a change in the water supply of London. A "Water Board" or some such body will one day have control over it, and this means that the purchase of the present concerns will have to be made. For this reason alone nothing should be sanctioned that would give the companies an opportunity to increase the already inflated value of their undertakings.

Conditions of Employment in Destructor Works.

We have received a copy of an interesting return obtained by Mr. John McTaggart, superintendent of the Cleansing and Destructor Department of Bradford. Recently the workmen of the department made application for an advance in wages, together with a week's holiday, with full wages, each year. Before giving an answer to this request the Council instructed Mr. McTaggart to obtain information as to the wages paid, hours worked, and holidays given by the principal municipal works in the United Kingdom. This return shows a remarkable difference both in hours worked and wages paid. The stokers at Rochdale only work 44 hours per week, and those of Bristol 45, while those of Darwen are employed for 72 hours. The eight-hour day is in force in Birkenhead, Birmingham, Edinburgh, Leeds, Oldham, and Sheffield. Twenty-seven towns are included in the return, and the average working week is 56·28 hours. In the Bradford destructor department the 48-hour week prevails. The variations in wages are as great as the hours worked. The most remarkable difference is that between Glasgow and Edinburgh. In the former place the wages are 4·75d. to 4·95d. per hour, whilst the latter city pays 7½d. Why there should be a margin of quite 30 per cent. between these two Scottish cities is difficult to understand. In only one town, Derby, is the rate lower than Glasgow, the stokers receiving from 4·64d. to 5·03d. per hour. Twelve towns pay from 5d. to 6d.; seven from 6d. to 7d.; five from 7d. to 8d. The best paid stokers are at Bristol, Edinburgh, Leeds, and Rochdale, and the average rate for the twenty-seven places is 6·12d. Bradford pays 7d. With regard to holidays, none are given in Blackburn, Bury, Colne, Darwen, Hyde, Liverpool, Oldham, Preston, Rochdale, St. Helen's, and Wigan; one day is given at Derby; two days at Birkenhead, Bolton, and Leeds; three days at Manchester, Nelson, and Sheffield; three and a-half at Burnley; four days at Huddersfield and Warrington; five at Birmingham; and five and a-quarter at Glasgow; six at Newcastle-on-Tyne; seven at Bristol and Edinburgh; and eight at Salford. Bradford gives two days to all the employés in the department. From this synopsis of the returns obtained by Mr. McTaggart it will be seen that the case for an advance of wages and a week's holiday is by no means a strong one.

A Good Record at Blackpool.

A few weeks ago we quoted the old saying that "a green Christmas makes a full churchyard," but happily there are no general signs of its fulfilment this year. Thus far the returns for the whole country have been generally satisfactory, but one of the best we have yet seen is from the well-known Lancashire health resort, Blackpool. This report only extends to the first week in February, and shows that out of a provisional population of 51,000 the deaths during the five weeks only totalled 58, against 105 births. A comparison of the two sets of figures perhaps explains the provisional total. Only two visitors died during the period, and when these are discounted the rate works out at 11·72, against 15·62 for the corresponding period of last year, and 18·1 for the 33 great towns. Of the 58 deaths 21 were under five years and thirteen over 65—thus leaving only 21, or an average of four per week, between the ages of 5 and 65. We are not surprised to see it stated by a local paper "that Blackpool's bill of health continues to give every satisfaction at home. That the advantages and benefits of our bracing wintry climate are becoming more and more appreciated abroad no one who frequents the Promenade in the pleasanter portions of the day can doubt."

Precautions against Small-pox.

In connection with the present epidemic of small-pox in Scotland, Sir Henry Littlejohn, Medical Officer of Health for Edinburgh, made the following recommendation to the Town Council. "Looking to the excellent results that followed the increase of the cleansing staff during the plague scare, I beg respectfully to urge upon the Town Council the benefit the city would receive, and more especially the poorer districts, were a similar step ordered while we are daily in expectation of an outbreak of small-pox. Not only were these districts, so to speak, sweetened, and their condition as to cleanliness improved, but the moral effect on the population was most marked, leading to active co-operation

with the sanitary officials." Such a recommendation, coming from such a quarter, might have been expected to be at once acceded to, but strange to say it met with an extraordinary amount of criticism and opposition. It seems to have been thought a reflection on the work of the ordinary cleansing staff, and on the discharge of their duties by the Sanitary Inspectors. The question of cost, though discussed, can hardly have been a serious matter, for only the other day the Town Council voted £1000 to the Public Health Committee to arm them against the threatened outbreak. After a great deal of jangling, the question was remitted to the Cleansing and Lighting Committee with powers. Sir Henry Littlejohn is fully prepared for the possibility of an outbreak. As yet there has only been one case in Edinburgh, but 5000 tubes of lymph have been issued to the medical men of the city, sufficient to inoculate 10,000 persons. The upper and middle classes are readily availing themselves of the opportunity to be re-vaccinated, but those in the poorer districts, who have most need to do so, have been slower to take advantage of the opportunity afforded them. One would hardly have thought that anti-vaccinators would have selected such a time for an assertion of their peculiar tenets, but a case had to be dealt with in the Edinburgh Sheriff Court last week. The accused grounded his objections on the fact that the vaccination of one of his children several years ago had been attended with bad results. The Sheriff attempted to remonstrate with the man on the unreasonableness of his fears, pointing out that with the lymph as now prepared all danger had been removed. The prosecutor explained that this was the sixth child for which the father had been prosecuted. In view of the imminent risk of an epidemic we think the man was most leniently dealt with in being fined only 18s., including costs, for in times of emergency the scruples of the individual must give place to the common weal. In Glasgow the decrease has proved but temporary. The Medical Officer's weekly return last Friday showed an unexpected increase, 130 admissions being recorded, with 90 discharges, and ten deaths. This is an increase of 79 fresh cases over the previous week. It is feared that March will bring with it a renewed activity of the disease.

The Shortening of Shop Hours.

In the House of Lords last week Lord Avebury—who is still better known as Sir John Lubbock—again brought forward the subject of the excessive hours of labour in shops. Last year he introduced a Bill to deal with the question, and it met with a chilling reception from Lord Salisbury; this year he contented himself with asking for the appointment of a Select Committee to inquire into the subject, and to this more limited demand Lord Salisbury could not well refuse to accede. But even in consenting to the proposal the Premier seemed to us to throw a good deal of cold water on it, professing much solicitude for the liberty of the working classes, who were practically without direct representation in Parliament, to make their purchases when it was most convenient. In his anxiety to protect the liberty of the working-class consumers, does he consider the fetters that economic laws impose on the liberty of the poor shop assistants, and the restrictions on their opportunities for enjoyment, exercise, social intercourse, and self-improvement, consequent on their excessively long working hours? Does he consider the effect upon their health that these long hours produce, especially in the case of women? Lord Avebury was able to take most of these points for granted. He had simply to refer to the unanimous resolution of the House of Commons that the hours of labour in shops were excessive, and that legislation was necessary; and to the report of the Committee which sat in 1886, that in many places the hours of labour ranged as high as eighty-four per week, or thirty more than were allowed under the Factory Acts. He also referred to the testimony of Lord Lister in the House last year as to the terrible effects of long hours on health, particularly in the case of women, to which there is absolutely no answer. The shopkeepers of the country are anxious to see the hours of labour shortened, and will readily support any reasonable proposal in this direction. They may well be trusted to be anxious to consult the convenience of their customers, and in any case the consent of the Local Authority, which is required under Lord Avebury's Early Closing Bill, should be sufficient to safeguard the interests of the consumers. It will be noted that in consenting to the appointment of the Select Committee, Lord Salisbury was most careful to guard himself against promising any legislative action consequent on the Committee's report. We earnestly trust, notwithstanding, that the inquiry will not be a merely academic one, but will be the prelude to practical legislation in the interests of the health of a large and important section of the community.

National Health Society.

OFFICIAL TRANSACTIONS.

Training Lectures.—On Monday next, March 11th, a course of lectures on "Public Health and the Duties of Sanitary Inspectors" will be commenced at 53, Berners-street, W., by Henry Kenwood, M.B., L.R.C.P., D.P. The Lectures will be given on Mondays at 4 p.m., and Thursdays 3.30 p.m., and will include several practical demonstrations and inspections of trades, disinfecting stations, &c. The opening lecture deals with "The Duties of the Sanitary Inspector—Objects and Methods of Inspection." The course forms part of the Society's special training for the examination of the Sanitary Inspectors' Examination Board, and for the diploma of the Society.

On Tuesday, March 12th, Dr. Squire will give the first lecture of his course on "Elementary Human Anatomy and Physiology." This course consists of ten lectures, and will be held on Tuesdays at 2 p.m. and Fridays 4 p.m. The lectures form a part of the training for the Society's diploma. The subject of the opening

lecture is "Human Physiology":—The science that treats of the life of man. The essential phenomena of life. Life in its simplest forms—protoplasm—cells. The human body derived from a single cell, and consisting of a commonwealth of cells all working in combination for the common good. Birth, growth, decay, and death. The general structure of the body, and the properties of the elementary tissues.

Examinations in "First Aid" and "Nursing" for the diploma of the Society are to be held at Berners-street during this week. Candidates for the Society's drawing-room certificates will also be examined on these subjects.

Homely Talks.—The following is an extract from a letter received from the secretary of a branch of the Mothers' Union, for whom one of the Society's lady lecturers has been lecturing at the Chapter House, St. Paul's:—"There has been only one verdict on the lectures, both from the ladies who heard them and from our poorer friends, and that is that they were excellent and immensely useful and enjoyable to them all."

Shropshire County Council.—We have received an application from the Technical Education Committee of the Shropshire County Council for Miss Forrester's services for a period of six weeks. Miss Forrester visited Shropshire during the autumn, when she made a most successful tour.

Sanitary Inspectors' Associations.

LONDON.

A general meeting of the members of the Sanitary Inspectors' Association was held on Saturday evening, at Carpenters' Hall, London Wall, E.C. Mr. W. H. Grigg (Fulham), chairman of the Council, presided, and there was a good attendance, including Messrs. T. G. Dee, H. Alexander, Ashdown, Bagshaw, Baxter, J. Jordan, I. Young, Morley, A. G. Duck, Johnson, and Mr. E. Tidman, C.E., the hon. secretary.

It was announced that the annual dinner of the Association, postponed on account of national mourning, is now definitely fixed for the 15th of March, at the Holborn Restaurant. Archdeacon Sinclair will preside, and most of the mayors of the new metropolitan boroughs will attend.

With regard to the uniform question, Mr. James Woonton (Stepney) informed the members that the Stepney Borough Council had decided to abolish all uniforms for Sanitary Inspectors, and had agreed to allow £10 per annum to each officer in lieu thereof.

The Chairman read a paper prepared by Mr. W. J. Addiscott, Chief Inspector of Plymouth, who was prevented by illness from attending, entitled "Some Aspects of the Housing Problem." He said that in dealing with this important social matter, difficulties of all kinds confronted the reformer. Notwithstanding all that had been done by private and public bodies, had we yet accomplished the end aimed at? No. He thought that we were not much nearer the solution of the problem than we were five years ago, and the question was now more pressing than it had ever been before. It was therefore their duty to look round and probe the question deeper still. The fault did not always lie with landlords, because he knew of cases in which the inhabitants of a district preferred to overcrowd old, bad dwellings rather than live in new ones provided at the same rental. A great question was the cost of building houses suitable to meet the wants of the working classes. This was not only caused by the increased price of land, but he did not believe this question would be satisfactorily settled until we get a Land Court established in this country. There was also an increase in the price of building material, an average rise of 25 per cent. having taken place since 1891. The cost of labour, as everyone knew, was also increasing. Rent went up, and this had the tendency to encourage overcrowding, because the higher the rent the less rooms were rented. Artisans and craftsmen earned good wages and were able to look after themselves, but it was the very poor, the unskilled labourer with a precarious living, the impecunious and the thriftless who had large families to bring up, these were the classes which required provision. By many causes, contributing to one end, overcrowding was assisted, and the question had many aspects. There was one important cure which people had in their own hands with which to reform this social evil, viz., temperance. The drinking and drunken habits of the people was a fruitful slum creating cause, and an important cause, of overcrowding. Many families earned good wages, yet owing to drinking habits lived under deplorable conditions. He thought these facts were well known to all his brother Inspectors. Then the general personal habits of the people was also a factor, for some families seemed to sink so low in the scale that if property they occupied was put into thorough repair this week, next week it would be as bad as ever. This was the class which gave the most trouble to Sanitary Authorities. One step would be to diminish the number of public-houses, while the establishment of public wash-houses and drying-places in the heart of the poorest districts would help to improve matters in the homes of the people. Ideal communities could be seen at Port Sunlight and Bournville, and these were a standard to which they could work. But good as cottage colonies are, the careless and thriftless would not avail themselves of such opportunities. Critics often complained of the laxity of Inspectors, but did it ever occur to the critics that they might help the Local Authority by reporting themselves the conditions of which they complained?

An interesting discussion ensued, Messrs. Duck, Alexander, Dee, Tidman, Johnson, Young, Morley, and the Chairman taking part, general agreement being expressed with the views in the paper. A hearty vote of thanks was accorded to the author, and the private conference of members followed.

NATIONAL UNION.

A conference of Sanitary Inspectors, who are members of the North-Western District of National Union of Sanitary Inspectors, was held last Saturday evening in Manchester. Representatives were present from Liverpool, Crewe, Manchester, and other towns and districts. Mr. J. Bland (Urmston) presided. Mr. J. A. Priestley, chief Sanitary Inspector of Nelson, read a paper on "The Old Century and the New from the Sanitary Inspectors' point of View," in which he contended that sanitation was the product of the Victorian era. The early days of the nineteenth century would not be looked back upon as initiating any great changes in the health of the various communities, and although the Public Health Act of 1848 was noteworthy as being the first public recognition by the Legislature that sanitary considerations came within the range and the duties of statesmanship, it was not until the lapse of a quarter of a century in 1872 that the office of Sanitary Inspector was established as a public appointment for both rural and urban districts. At the end of the century the status of the Sanitary Inspector had greatly improved, salaries were higher, the duties were more responsible, their knowledge was greater and their work better appreciated, whilst on the other hand there were many disadvantages under which they had to labour, and there were many improvements which it must be

their aim and endeavour to secure. These included fixity of tenure, superannuation, the extension, amendment, and consolidation of the public health laws, which were of such importance that they called for the attention of the Legislature. A discussion followed.

Public Works.

SEWERAGE.

GREAT SUTTON has decided in favour of a complete sewerage scheme, the cost of which is estimated at £4400.

THE Sedgefield Rural District Council has consulted Messrs. D. Balfour and Son, of London and Newcastle, as to the main sewerage of Trimdon.

AT the monthly meeting of the Belfast Urban District Council the estimated cost of the Greencastle and Whitehouse sewerage scheme was stated to be £5223.

AT the last meeting of the Sewerage Committee of Aberdeen Town Council, the estimate of Messrs Peter Bisset and Sons for the construction of the new storm water culvert in Holburn-street, amounting to £3196, was accepted.

THE Dumfries Town Council has resolved to purchase the estate of Castledykes for £7000 for the proposed sewage works. Castledykes, which is on the extreme south of the burgh, between the foot of the Dock Park and Kingholm, is the site of the old Castle of Dumfries that William the Lion built, and is a picturesque spot. It contains a fine mansion house, situated on an elevated rock overlooking the river.

A LOCAL Government Board inquiry has been held at Lisburn by Mr. P. C. Cowan into a petition by the Lisburn Urban Council to the Local Government Board for a provisional order under the Public Health (Ireland) Acts, 1878 to 1896, to empower the Council to put in force the provisions of the Lands Clauses Acts with respect to the purchase and taking—otherwise than by agreement—of the lands set forth in the petition, for the sanction of a loan of £23,266 12s. 9d. for the purpose of sewerage works, and for £3600 for the purchase of a Town Hall.

AT a meeting of the Royal Scottish Society of Arts, held in Edinburgh last week, Mr. James Thomson, C.E., dealt shortly with the engineering aspect of the septic treatment of sewage, and with the problems presented to engineers of sewage purification works. The septic system was recommended on account of the very small area of ground which it occupied, the minimum amount of attention which its works required, the minimum amount of sludge produced, and the smallest possible amount of smell which an installation of that kind created. He pointed out that the distribution of the sewage over the filtering area was one of the greatest difficulties to be met with, and a number of distributors (including one of Mr. Thomson's own design) were described. Mr. Thomson was in favour of closed septic tanks and open bacteria beds for small communities, but for large communities he was in favour of both open septic tanks and open bacteria beds. He was in favour of continuous filtration in preference to intermittent filtration for small communities, and for large communities of intermittent filtration. The sewage purification works in connection with the proposed lunatic asylum at Bangor for the Edinburgh Parish Council were referred to, and it was pointed out that there it was intended to dispense with automatic gearing, and to have an attendant to actuate the valves when required. In conclusion, the engineer referred to the cost of installation of this system in various parts of the country.

THE St. Columb ratepayers have decided to recommend the Rural District Council to adopt Mr. Worth's scheme of sewage disposal for the district.

ACCORDING to the latest news to hand from Sydney, N.S.W., the Water and Sewerage Board has approved the recommendations of the Engineer for extension to the sewerage reticulation at North Sydney, near Cammeray Park, at an estimated cost of £1600; sewer, Bondi-road, Bondi, to cost £600; and extension to the sewerage reticulation of Randwick, to cost £1400.

AT the last quarterly meeting of the Armagh County Council a letter was read from the Lurgan Rural Council enclosing for adoption by the County Council a resolution calling upon the Government to take some steps to make the present Bann drainage system effective in preventing flooding of the districts affected. Accordingly a notice of motion in support of same was handed in.

AT the last meeting of the Tredegar Council Messrs. Beasley, Sons, and Nichols, engineers, were appointed to report upon the best system for disposing of the sewage of the district. The Council was impressed with the urgent necessity of destroying the refuse, as large tips had accumulated in close proximity to dwellings. It was reported that persistent overcrowding had disappeared, and the insanitary dwellings were gradually decreasing.

PROGRESS is being made with the water supply and sewage disposal scheme at Carlton. At Notton a spring from which water is used for domestic purposes is being polluted by sewage from Roystone, and the water supply and sewage disposal at Wooley Colliery is unsatisfactory. The Clerk to the Barnsley Council reports that the negotiations with regard to the Carlton sewage scheme have been completed, and he has been instructed to write respecting the other matters mentioned.

MR. DONALD CAMERON, City Surveyor, Exeter, in his last report states that the work of constructing the main intercepting sewer is now finished, with the exception of two lengths. With regard to the St. Thomas sewage, the Local Government Board has written that it raises no objection to the septic system "as an experimental process, for which the Town Council take entire responsibility," but considers that the works should be designed on a basis of a minimum dry-weather flow of 230,000 gallons a day, instead of 170,000 gallons as proposed, and amended plans are being prepared accordingly.

MR. NORTH, A.M. Inst. C.E., the Inspector of the Local Government Board, visited Morpeth last week to inspect the site at the Low Stanners proposed for the bacterial tanks, and the land in the Parish Haugh for the sewage disposal works. An application was also made at the County-court, Morpeth, on Tuesday, before Judge Greenwell, for a further extension of time for the carrying out of the works to prevent the pollution of the river Wansbeck, designed by Messrs. D. Balfour and Son, of London and Newcastle, when it was agreed that the Urban Council should come before the Court again in April, to have a Peremptory Order made.

COLONEL W. R. SLACKE, R.E., recently held an inquiry at the Urban District Council offices, Newhaven, into the application of the Council to borrow £1143 for sewerage and street improvements. The Clerk explained that the loan was required owing the large growth of the town, which rendered it absolutely necessary that the main sewer should be extended and another portion altered so that the low-lying sewers through the ship yard and Chapel-street might be relieved of the whole of the sewage from the higher part of the town. Mr. F. J. Rayner, the Town Surveyor, then explained the proposed scheme of sewerage and the different street works, and there being no opposition the inquiry terminated.

The Romily Urban District Council has decided to apply for sanction to borrow £6480 for land required for sewage disposal, and £470 for tramway purposes.

A Local Government Board inquiry was held at Newcastle-under-Lyme last week by Mr. H. Percy Boulnois, M.I.C.E., and Mr. L. W. Darra Mair, M.D., with respect to an application by the Town Council for sanction to a loan of £15,000 for the purpose of the reconstruction of the main outfall sewer and sewage disposal works. The scheme has been prepared by Messrs. Willcox and Raikes, civil engineers, of Birmingham, and comprised a new main outfall sewer and the construction of 6500 yards of bacteria beds, together with the diversion of brook course as well as laying out certain areas of land for dealing with storm water. Many witnesses were called, and the Inspectors visited the site of the proposed works.

WATER.

The Brixworth Rural District Council has decided to spend £800 in improving the water supply of Great Creaton.

The Hastings Town Council has decided to lay new water mains in several of the principal thoroughfares in the town at a cost of £2623.

The Toronto and Lake Erie ports, on both sides, are threatened with a great loss, owing to the lowering of the lake level by the drawing off of the water in the Niagara River. A great volume of water is now utilised for furnishing electrical energy, and this is the cause of the shrinkage. The Ontario Surveyors' Association are discussing the remedy and improvements in the supply, which, if adopted, will cost 2,000,000 dols.

At a special meeting of the Ripley Urban District Council, Dr. Hooper, who presided, moved: "That this Council petition against and do oppose the Ilkeston and Heanor Water Bill, and take all necessary legal and other steps in the matter, and do obtain all clerical, legal, and other assistance for the purpose." The ground on which they would oppose the Bill was that the streets of Ripley would be cut up, and the mains interfered with to a great extent. They should have a clause inserted whereby they might get compensation for the streets being taken up. The resolution was carried unanimously.

The usual fortnightly return of the Edinburgh Water Board just issued shows that the total quantity of water in the reservoirs on the 26th ult. was 2,655,195,000 gallons, or a decrease of 10,971,000 gallons as compared with the quantity stored on the 12th inst. During the previous fourteen days the average delivery in the city was 16,456,000 gallons—equal to 39·17 gallons per head per day to a population of 420,000. The rainfall at Glencorse from the 1st to the 26th inst. was 3·10in., and at Gladhouse 3·51in.; while for the corresponding periods last year the figures were :—Glencorse, 9·00in.; Gladhouse, 8·25in.; and in 1899—Glencorse, 7·70in.; Gladhouse, 6·65in.

The Wisbech Waterworks Company has a Bill before Parliament intended to secure an extension of its powers. The Wisbech Corporation and March Urban Council have resolved to petition against the Bill. The Town Council declares that its opposition is simply designed to protect the interests of the ratepayers. The Waterworks Company, on the other hand, alleges sinister designs on the property of the company—in fact, they affirm that the Corporation desire to buy them out, and that their opposition is prompted by the hope of thus more easily attaining their object. It is difficult to determine between the two bodies, but the ratepayers are to express themselves by a poll of the borough. The situation is an interesting one, and developments will be awaited with interest.

At Millom last week a gathering of ratepayers and owners of property was held to take into consideration the Bill being promoted in Parliament by the Barrow Corporation to enable them to take water from the river Duddon. The meeting considered that the Bill would be detrimental to the interests of Millom as a town and port, seeing that it would interfere with the scour in the Duddon, and so prevent sewage from being taken to sea, and also that navigation would be endangered. It was decided to oppose the Bill, the cost to be charged to the rates.

At the last monthly meeting of the Sleaford Rural District Council Mr. J. Clare, C.E., made a special report as to the inadequate water supply of Digby, and stated that a further outbreak of typhoid fever had occurred through drinking water from a polluted well. Half of the houses were without a supply, and the wells supplying the remainder contained water of a questionable quality. Dr. Giles had analysed the water, and found it contaminated with sewage matter. It was resolved that the well in question be closed, and that Mr. Clare prepare a plan and estimate for a proper water supply for the parish, the Parish Council having already communicated with the Local Government Board on the subject.

At a recent meeting of the Hunslet Rural District Council, the principal subject discussed was the alleged presence of lead in the water supply to Middleton. The question had been raised by Dr. Buck in his annual report, which stated that the Middleton water, supplied from Morley, still acts on the lead when standing in the pipes overnight. Various samples had been taken during the year, and no improvement had been perceptible, and he was of opinion that the matter should be brought before the Morley Corporation, with a view to its abatement. After discussion, it was agreed that the inhabitants of the district be informed that it was not desirable to use the water in the morning without first opening the tap and letting it run some time. The chairman said they must prepare themselves for a considerable waste of water.

A matter of considerable importance to the Tees-side boroughs came before the Middlesbrough General Purposes Committee last week. The Darlington Corporation proposes, it appears, to increase its water supply from the Tees, and that can only be done by appropriating a very large proportion of the compensation water which the Tees Valley Water Board have to discharge into the river. When it is remembered that it was the Darlington Corporations who compelled the Water Board to discharge this compensation water from the Balder Reservoir into the river, its present action, in the absence of explanation, seems somewhat strange. A Sub-committee has been appointed by the General Purposes Committee to consider the question, and there can be no doubt that the scheme of the Darlington Corporation will be strenuously opposed if found to be injurious to the river and the towns upon its lower reaches.

LIGHTING.

The Electric Light Company have broken up the Barnet roads in order to lay their cables, and have left them in such a state that the Council declines to give the company a certificate that they have left the roads in a good condition.

At the last meeting of the Bridgwater Town Council a communication was read from the Local Government Board respecting the application made last year by the Town Council for sanction to borrow £20,000 for purposes of electric light, and stating that unless the Town Council passed a resolution renewing the application, the Board proposed to regard the original application as withdrawn.

An extension of the Conway gasworks is to be undertaken, at a cost of £8000.

The net profit of the Oxford Electric Light Company for the past year ending December 31st, 1900, is stated to be £2905 11s. 10d.

A Board of Trade inquiry was held at Carnarvon last week with reference to the Provisional Order sought for the lighting of the town by electricity.

A Local Government Board inquiry has been held at Derby, relative to proposed loans of £35,850 for electric lighting purposes, and £1785 for works of street improvement.

The annual meeting of the Exeter Gas Light and Coke Company took place last week. The report, which was of a very satisfactory character, was adopted, and the usual dividends were declared.

We understand that the Municipality of the City of Bombay has granted a concession to Mr. W. Gentry Bingham, on behalf of the British Pioneer Electric Light and Power Company of India, for the electric lighting of the city, and for the electrical equipment of the existing 60 miles of horse tramways, and that a group of city financiers has guaranteed the necessary funds for that purpose, amounting to about £2,000,000 sterling.

The Lichfield District Council has decided that an application be made to the Local Government Board for the issue of an Order investing them with the powers of the first paragraph of Section 161 of the Public Health Act, 1875, with a view to making the necessary provision for the lighting of the portion of the main road in the parishes of Brereton and Colton, which leads from the town of Rugeley to the Rugeley Junction Railway Station, and that the Local Government Board be further requested to order the expenses of lighting the same to be special expenses chargeable upon the said parishes of Brereton and Colton.

The Examiners having reported that in the case of the South Yorkshire Electric Power Bill the Standing Orders had not been complied with, the matter last week came under the consideration of the Standing Orders Committee of the House of Commons. The Committee having deliberated in private, the parliamentary agent for the promoters was called in, and Mr. Halsey, the chairman, announced the decision of the Committee. He said they had decided to allow the Standing Orders to be dispensed with on the condition that the proposed exemption of the undertaking from the provisions of Section 81 of the Electric Lighting Act of 1899 be struck out of the Bill.

In the half-yearly report of the Cheltenham Gas Company recently submitted, the directors recommended the payment of the maximum statutory dividend of 5 per cent. per annum upon the paid-up consolidated ordinary stock. The operations of the company for the year have been satisfactory. The gas consumed shows an increase of upwards of 24,000,000 cubic feet, as compared with that of the previous year, and the number of gas consumers, both on the ordinary and coin meter systems, shows the average yearly increase. The values of residual products have during the greater portion of the year been well maintained. The sale by auction of £5000 consolidated ordinary stock realised a premium of £1315 10s.; and to provide for the further requirements of the company, the directors propose to offer another sum of £5000 of such stock. The revenue account gives a total expenditure of £55,915, of which £44,906 is for the manufacture of gas, £4775 for the distribution of gas, £1979 for public lamps, £1284 for rates and taxes, and £2677 management expenses. The receipts were £51,110 by the sale of gas, meter, and stove rents, £18,516 by residual products, and £1142 for other items, making a total of £70,770, and a profit balance of £14,854.

The London County Council has agreed to lend the Battersea Borough Council £10,600 for electric light installation.

The Hendon Urban District Council contemplates lighting its district by electricity under the Order obtained some time ago.

The Eastwood Urban District Council has unanimously decided to oppose the Derbyshire and Notts Electric Power Bill.

The directors of the British Gas Light Company, Limited, propose to recommend a dividend at the rate of 10 per cent. per annum for the half-year ended December 31st last.

The Lodging-house Sub-committee of Aberdeen Town Council met last Friday, and had under consideration the question of the lighting of the Corporation lodging-house. When the building was erected it was fitted with an installation of the electric light, but this system of illumination is considered to be far too costly for such an institution, the annual bill running to about £200. It was therefore resolved to request the city architect to submit an estimate of the cost of providing gas fittings, with a view to introducing gas instead of electric light. It was also decided, in order to the better conduct of the house, to empower the superintendent to adhere more rigidly to the rules as originally laid down by the Town Council.

The directors of the Abingdon Gas Light and Coke Company, Limited, have just issued their report for the year ending December 31st last. The accounts show, after providing for interest on the debenture bonds and the interim dividend paid in October last, a balance of £1402 17s. 3d. The quantity of gas sold during the year amounted to 19,054,600 cubic feet, being an increase of 1,609,000ft. on that of the previous year. During the past year the construction of the regenerative furnaces have been completed, and the directors were glad to report that they had proved very satisfactory in their working. The saving effected by the installation of these furnaces obviated the necessity of raising the price of gas, which the increased cost of coal would have otherwise rendered compulsory.

Last week a resolution was unanimously passed by a meeting of owners and ratepayers of Cleckheaton, held at the Town Hall, authorising the District Council to oppose in Parliament the Bill which is being jointly promoted by the Heckmondwike and Liversedge Councils for the acquisition of the undertaking of the Heckmondwike Gas Company. The proposal of the Bill is to authorise the joint boards to supply gas throughout Heckmondwike and Liversedge, two portions of which latter—namely, Moorbottom and Marsh—are within the statutory gas area of Cleckheaton. In reply to a question, Mr. W. H. Clough, the Council's solicitor, read correspondence showing that a request for a protective clause had not been satisfactorily met, and said that the Council, therefore, felt bound to proceed to opposition to secure their rights.

A Board of Trade inquiry by Sir Courtenay Boyle was opened at the Westminster Town Hall last Friday into the question whether electric lighting companies and Local Authorities supplying electricity can raise the current from 100 volts to 200 volts without the consent of the consumer. In 1896 the Board of Trade made regulations for ensuring a proper and sufficient supply of energy. These regulations contained a proviso:—"That no change should be made in the pressure of the supply to any premises which, at the date of these regulations, were supplied with energy by the undertakers except with the consent of the consumer." The alteration applied for by the Westminster Electric Company (which has led to this inquiry) was to substitute for the words "with the consent of the consumer," the words:—"On such terms and conditions as may be agreed

upon between the undertakers and the consumer, or, failing agreement, as may be settled by an arbitrator appointed by the Board of Trade." The inquiry was adjourned until to-day.

GENERAL.

THE Leicester Council proposes purchasing and erecting new public baths at the municipal offices.

THE Local Government Board has sanctioned a loan of £6000 for the enlargement of the hospital at Keycol Hill.

THE Leamington Town Council has decided to provide a Horsfall refuse destructor and other necessary works for the destruction of the town refuse.

THE Local Government Board has sanctioned the borrowing by the Chelmsford Town Council of £4750 for the erection of an infectious diseases hospital.

HASTINGS has had a Special Committee formed to find out the best means for promoting housing reform in the town. At the last meeting of this body one member asserted that there were twenty-eight persons living in a four-roomed house, and that this is but a sample of what prevails in the poorer parts of the town.

AT Hanley, last Thursday, the Corporation—for whom Mr. A. Challinor, Town Clerk, appeared—obtained orders from the borough magistrates, under the Housing of the Working Classes Act, 1890, for the closing of four dwelling-houses which were certified by the Medical Officer to be in an insanitary condition and unfit for human habitation.

IN the course of an inquiry before the Magistrate at Romford, into the death of a child, it came out in evidence that nine persons slept in one room—six in one bed and three in another. The state of the house was "simply filthy." The family was too poor to live in a better house, and yet the "mother" could send to the public-house six times a day for beer.

A CHANGE is to be made in the collection of offensive refuse from tradesmen in Woolwich. Hitherto the Local Authority has removed such refuse free of cost; but after the present month it is proposed to charge a small sum for each receptacle collected. At the last meeting of the Council three suggested charges were put forth, viz., 3d., 4¾d., and 6d., but eventually the whole matter was referred back to the Committee bringing up the report.

THE Markets Committee of the Manchester City Council has issued a report in which an account is given of the unwholesome food condemned and destroyed in the city under the Public Health Act, 1875, during last year. This includes 179,598 lb. of meat, 146,040 lb. of fish, and quantities of poultry and game, fruit, and vegetables. Nearly the whole, it is stated, was surrendered by the trade after being condemned by the Inspectors. There were seven prosecutions under the Public Health Act, and in each instance a fine was imposed.

AT the last meeting of the Common Council of the City of London, the Joint Sanitary and Officers and Clerks' Committee brought up a report with regard to the vacant offices of Medical Officer of Health and Public Analyst, held by the late Dr. Sedgwick Saunders. It was resolved that the Medical Officer should devote the whole of his time to the work, and receive a salary of £1000 per annum, and that the candidates were to be not less than thirty-five or more than fifty. In regard to the Public Analyst, it was decided that his salary should be £200 (minimum), or at the rate of 10s. per sample analysed. The Committee were empowered to select three candidates for each position for submission to the Court.

THE Billericay Rural District Council has decided to apply to the Local Government Board for sanction to borrow £1000 for tar-paving footpaths in Shenfield and South Weald parishes.

COL. LUARD, R.E., held an inquiry at Ilford last week in reference to an application of the Ilford Urban Council to borrow £1000 for fire hydrants, £500 for a manual fire engine, fire escape, and other accessories, and £350 for wagons for scavenging purposes. There was no opposition.

AT a recent meeting of the Farsley District Council, proposals were submitted for building about eighty "back-to-back houses." After an animated and lengthy discussion the plans were rejected. We are surprised to know that some of the plans were submitted on behalf of one who formerly occupied the position of Medical Officer of Health.

THE Manchester Port Sanitary Authority on Monday last decided to take special precautions against the spread of plague. It was reported that since 1894 the plague had spread generally along the lines of commerce; that it is to be found along a belt of at least 200 miles in South America, and that its presence is traced in India, the Cape of Good Hope, and Singapore.

THE Special Committee of the Salford Town Council, appointed to consider whether any member of the Council had contravened the Municipal Corporation Act by accepting directly or indirectly corporation contracts, reported on Monday that in its unanimous opinion three councillors had shown a lack of scrupulous regard for their obligations as members of the Council. The amounts involved in all the cases reported upon were small.

THE Governors of the Peabody Donation Fund point out in their thirty-sixth annual report that the trusts are now under Royal Charter. The net gain of the year from rents and interest had been £36,197 8s. 7d., the total fund up to the 31st December last amounting to £1,327,548 17s. 1d. By the end of the year the Governors had provided for the artisan and labouring poor of London 11,439 rooms, besides bath-rooms, laundries, and lavatories. The rooms comprised 5159 separate dwellings, viz., 100 of four rooms, 1770 of three rooms, 2440 of two rooms, and 849 of one room. The average weekly earnings of the head of each family in residence was £1 3s. 1¼d., and the average rent of each room 2s. 3¼d.; the rent in all cases including the free use of water, laundries, sculleries, and bath-rooms.

THE Barry District Council's refuse destructor is now completed, and was opened on Wednesday, the 6th inst. It is the first of the kind in Wales, and was constructed from plans prepared by the Surveyor to the Council (Mr. J. C. Pardoe), and built by Messrs. Lloyd and Tape, Barry Dock, at a total cost of £8000. The buildings abut on the Barry-road, Cadoxton, at the foot of Crogan Hill, the area of the site being 1 acre 1 rood 25 perches. From Barry-road there is an inclined roadway, from the top of which the refuse is tipped into the cells, of which there are two, capable of burning 30 tons of house refuse to a hard innocuous clinker per day. The cells are adapted for the destruction of all kinds of town and market refuse, including condemned meat, fish, infected mattresses, &c. The boiler is suitable for a daily working pressure of 150 lb. to the square inch. The engine room contains one horizontal high-pressure engine (non-condensing), with a cylinder 10in. diameter for a stroke of 20in. There is one high-pressure fan, with steel shaft and protected bearings. The whole of the floor of the building is covered with granite paving. The chimney stack was constructed by Mr. J. Prout, contractor, Barry Dock, and is 150ft. high, with detached fire-clay brick lining, 5ft. internal diameter, carried to a height of 125ft., and close fire-clay lining to the top. The buildings will be lighted by electricity.

A Local Government Board inquiry has been held at Bootle with reference to the application of the Town Council for power to borrow £8150 for additions and alterations to the Town Hall and offices, and £7000 for sanitary improvements.

The foundation stone of a new lunatic asylum for the county of Middlesex was laid on Tuesday in last week, by the Chairman of the Asylum Committee. The site of the new building is 440 acres in extent, and was purchased at a cost of £45,000. It is situated just outside St. Albans, at Napsbury. The estimated cost of the buildings alone is £358,100.

The continued prevalence of measles in Liverpool was referred to by Dr. Hope at the meeting of the Liverpool Health Committee last Thursday, and it was stated that the malady did not show signs of decreasing. Thirty-one deaths were registered last week. A considerable number of schools had been closed. The disease was confined practically to the north, centre, and east of the town. At a meeting of the Toxteth Park Guardians, on Thursday, it was agreed to accede to the request of the city Medical Officer of Health, and receive cases of measles in their hospital.

The Lord Provost of Glasgow last Saturday stated that exaggerated and ludicrous reports of the small-pox epidemic had been published on the Continent which might seriously threaten the prospects of the International Exhibition to be opened in the city in May. He hoped the Press would in referring to the outbreak not go beyond the real facts. Daily bulletins would be resumed, and large medical and sanitary staffs had been engaged to persuade people to be re-vaccinated. Monday's bulletin stated that since Saturday 39 cases had been admitted to hospital, 13 had died, and 54 patients had been discharged as cured, leaving 370 still in hospital.

On the 7th March, 1892, the Local Government Board of Scotland found it necessary to issue a circular directing attention to the necessity of care in the removal of sick persons to the poorhouse, and they have reason to hope that benefit has resulted. But cases have lately occurred which appear to indicate the necessity of an addition to the form of medical certificate, with the object of reminding the certifying Medical Officer of points for the consideration of which he is responsible, and which the Board regard as of special importance. Copies of the form as now revised have been issued, and the expediency of providing modern ambulance carriages for the use of at least all the larger poorhouses is suggested. The removing officer or other official in charge should be authorised to delay, or abstain from, removal if the condition of the patient appears to be alarming, until further advice is obtained.

PERSONAL.

Dr. Brodie has been reappointed Medical Officer of Health for Battle.

Dr. Kennedy has been reappointed Medical Officer of Health for Beaconsfield.

Mr. G. F. Metzger has been appointed Chief Electrical Engineer to the Manchester City Council.

Dr. A. J. B. Adams, of Barnes, has been appointed Medical Officer of the Children's Homes, Barnes.

Dr. J. Dixon Adams has been unanimously reappointed Medical Officer for Yeovil for the ensuing year.

Dr. Trotter has been reappointed Medical Officer of Health for Honley, and Mr. Joseph Ranfield has been reappointed Sanitary Inspector, at salaries of £25 and £30 per annum respectively.

The Local Government Board has sanctioned the reappointment of Mr. Richard Hoyle as Sanitary Inspector for Haslingdon.

Dr. Bond and Mr. W. Williams have been reappointed Medical Officer of Health and Inspector of Nuisances respectively for Chepstow.

Mr. W. E. A. Hay has been unanimously reappointed Medical Officer of Health and Mr. J. W. S. Bartlett Inspector of Nuisances for Bridport.

Mr. D. Balfour, jun., of Messrs. D. Balfour and Son, of London and Newcastle, has been elected a Member of the Institution of Civil Engineers.

Dr. E. J. Sheppard, Public Vaccinator for the Clifton district of the Bristol union, has been awarded for the seventh consecutive time the Government grant for efficient vaccination.

The salary of Mr. M. W. Wilkins, as Town Clerk for Battersea, has been increased from £500 to £760, with the proviso that all sums be received for acting as returning officer, &c., should be paid into the borough funds.

OBITUARY.

MR. F. SIMS, OF DOVER.

We record with regret the death of Mr. F. Sims, the Dover Chief Sanitary Inspector. Mr. Sims has been off duty for several weeks, and his advanced age, coupled with the recent death of his only son, were circumstances against his recovery. He has lain in a critical condition for several days, and passed away at ten o'clock on Wednesday night in last week. Mr. Sims has been the Sanitary Inspector of the Town Council for about forty years, and he has done his duty during that period with good judgment, and with sufficient energy for practical purposes. For a long time he worked single-handed, but for several years past he has been relieved by the able assistance of Mr. Pine, and only a few days before his death another officer, Mr. Pryor, was appointed for special duties connected with the port and the drainage. His death will lead to a re-arrangement of duties, but probably not to the appointment of another official at the present time.

FORTHCOMING MEETINGS.

March.

Friday 8th.—The Sanitary Institute—Lecture to Sanitary Officers at 7 p.m. "Sanitary Building Construction and Planning: Soil and Local Physical Conditions," by Professor T. Roger Smith, F.R.I.B.A.

Friday 8th.—The Sanitary Institute—Examinations in Practical Sanitary Science and for Inspectors of Nuisances, Edinburgh.

Saturday 9th.—The Sanitary Institute—Examinations in Practical Sanitary Science and for Inspectors of Nuisances, Edinburgh.

Saturday 9th.—Inspection and Demonstration at Beddington Sewage Farm, at 3 p.m., conducted by T. Walker, Borough Engineer and Surveyor, Croydon.

Saturday 9th.—Lecture to School Teachers, Bedford College.

Monday 11th.—The Sanitary Institute—Lecture to Sanitary Officers at 7 p.m. "Ventilation, Lighting, and Warming," by W. C. Tyndale, M. Inst. C.E.

Tuesday 12th.—The Sanitary Institute—Lecture to Sanitary Officers at 7 p.m. "Calculations, Measurements, and Plans and Sections," by W. C. Tyndale, M. Inst. C.E.

Wednesday 13th.—The Sanitary Institute—Sessional Meeting at 8 p.m. Discussion on "Ventilation: Success and Failures of the Methods at Present in Use," by Christopher Childs, M.A., M.D., D.P.H.

NOTES AND QUERIES.

Subscribers may obtain advice on matters appertaining to Public Health Law and Municipal and Sanitary Engineering. Letters should be addressed "Notes and Queries," THE SANITARY RECORD, 5, Fetter-lane, London, E.C. If an answer be required immediately, a stamped addressed envelope must be enclosed

2108.—TRADE REFUSE: MEANING OF.—"A.I.S.E." writes:—"Under Sec. 42 of the Public Health Act, 1875, the Local Authority undertakes the removal of house refuse. Would you advise whether this would include the refuse from a large restaurant, and also from wholesale and retail grocery, drapery, and other businesses? Will you also please give me a definition of trade refuse?"

Answer.—We are of opinion that the refuse from each class of premises referred to is trade refuse. There is no statutory definition of the term "trade refuse." Local Authorities can only be required to remove such refuse as is ordinarily found or created in a house, using the expression "house" in the restricted sense of a "dwelling-house." They are not bound to remove dust and ashes, the exclusive produce of factories, mills, or workshops, or clinker from furnaces, or refuse of a similar kind.

2109.—WATER SUPPLY: TESTS FOR HARDNESS: BOOKS ON.—"H. J." writes:—"Can you recommend me a book on water supply, and as to the different methods of detecting hard water, and the means to be taken for softening same?"

Answer.—Rideal's "Water and its Purification," price 7s. 6d., is an excellent book for the use, as indicated by its sub-title, of "Local Authorities, Sanitary Officers, and others interested in water supply." The methods in use for the softening of water are described. For those who do not possess a knowledge of chemistry, Danchell's "Tests for the Detection of Impurities in Water," &c., may be used. These tests are described in the *brochure*, "Water: Its Impurities and Purification," price 6d., published by the London and General Water Purifying Company, Limited. Either of the books may be obtained from the offices of this journal.

2110.—ELECTRIC LIGHT MAINS: PROXIMITY TO IRON GAS MAINS.—"Surveyor" writes:—"An electric lighting company are about to lay their mains in the streets within a foot of the gas mains. The Council think this is very undesirable, on account of leakage, &c., of the electric mains, and that the latter ought to be much further from the gas mains. Will you inform me if there is any specified distance at which electric mains should be laid from the gas mains with safety?"

Answer.—There is no distance prescribed by the Electric Lighting Acts or Orders issued by the Board of Trade under the Acts, in respect to which electric light mains shall be laid from gas or water mains. If the electric light mains are properly laid in earthenware conduits imperviously jointed, and the copper strips properly insulated by covering, no danger may be apprehended from the mains being laid within one foot of each other.

2111.—COMPO-BOARD: MANUFACTURERS OF.—"Architect" writes:—"Can you oblige by giving me the name and address of the material known and described as compo-board, and referred to in your issue of November 9th, page 418?"

Answer.—The British Compo-Board Company, 18, Brescoe-street, Golden-lane, London, E.C. We advise all architects to obtain a sample of the material.

2112.—INSANITARY PREMISES: POWER OF DEMOLITION.—"Surveyor" writes:—"Kindly advise on the following:—A. built a house about thirty years ago. By the terms of his lease he has an 8ft. right of way outside his garden wall. B., who is now dead, obtained verbal permission from A. to build a hut, to which A.'s garden wall forms the back wall of the hut, which was intended for human habitation for about seven years. On several occasions, A. made a verbal request for the removal of the hut, but being on friendly terms with B.'s relatives, did not press on them. The hut has, however, now been occupied for about twenty-five years. A. is building a stable at the end of his garden, the drain of which must be laid underneath the floor of the hut. Query:—(1) Can A. compel the removal of the hut now? (2) If not, can he claim to lay his drain underneath the floor of the hut, which will be a separate drain for the stable alone? (3) In case the hut cannot be removed, and A. making use of the stable, will you advise which building will have to be demolished, the hut or the stable; that is, if the Medical Officer of Health will condemn the hut as being unfit for human habitation, on account of being too near the stable?"

Answer.—(1) No. (2) Not without paying compensation, even assuming that by the terms of his lease he is entitled to lay a drain in the original right of way. (3) Without the facts as to the sanitary condition of the two buildings, it is quite impossible for us to advise. We do not see, however, under what circumstances the Medical Officer of Health can condemn the new stable so as to secure its demolition.

2113.—HOUSE DRAINS: VELOCITY FOR SELF-CLEANSING.—"H. J." writes:—"The drain of a house is 75ft. long, and it is only possible to get 14½in. in that length. With such a fall, should the drain be of 6in. or 4in. diameter? What velocity per minute would each size have, and if a 4in. drain was laid, would it be self-cleansing? There are three water-closets, one bath, one lavatory, and one scullery sink discharging into it, and in any case they will be only 4in. in diameter. The diameter of drain from sewer to, and including that of the interceptor, is 6in., the taper-pipe being the first one outside the manhole?"

Answer.—The gradient or rate of inclination of a drain laid with a fall of 14½in. in 75ft. is 1 in 62·07. It is required to know whether either a 6in. or a 4in. pipe drain laid at this gradient would be self-cleansing, and to determine this it is necessary to ascertain what will be the velocity of flow. This may be ascertained when the gradient and diameter of pipe is known from Eytelwein's formula, viz.:—

$V = 55 \sqrt{R \times 2H}$, where

V = the velocity in feet per minute.

R = the hydraulic mean depth of the pipe in feet, which in those running full or half full is found by dividing the diameter by 4.

H = the fall in feet per minute.

Or the velocity may be found from tables such as Crimp's

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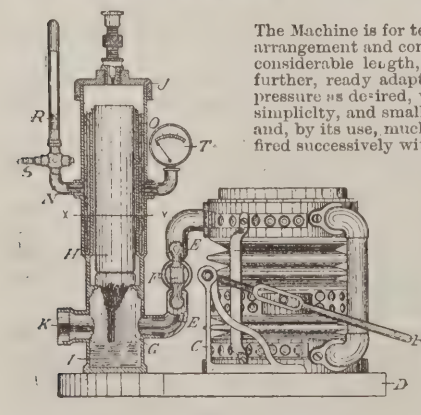
No. 11222.



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2114.—Housing of the Working Classes Act, 1890: Owner.—"W.H.O." writes:—"In Section 32, Part II., of the above Act, Local Authorities are directed to take proceedings before justices for the closing of dwelling-houses unfit for human habitation, but in the definition of owner in Sec. 29, the term includes all lessees or mortgagees of any premises required to be dealt with under this part of this Act, except persons holding or entitled to the rents and profits of such premises for a term of years, of which twenty-one years do not remain unexpired. Am I to understand by this that a closing order cannot be obtained against an owner whose lease has less than twenty-one years to run?"

Answer.—The interpretation to be placed upon the section is that a closing order cannot be obtained against a lessee whose lease expires within twenty-one years, but against the superior landlord. The Local Authority in dealing with houses which are unfit for human habitation have the option of taking proceedings under the Public Health Act or under the Housing of the Working Classes Act in cases where a house can be rendered fit for human habitation. When proceedings are taken under the former Act, the "owner" is the person defined as such in Sec. 4 of the Act of 1875. But when it is desired to obtain a demolition order proceedings should be taken under the Housing of the Working Classes Act, 1890.

2115.—New Building: Approval of by Local Authority Entails no Liability.—"Plymouth" writes:—"(1) The owner of a yard has blocked up some windows of a house belonging to another owner, which windows overlooked his yard. Can he legally do so, as it may be said that the health of the occupants of the house is endangered from want of light and ventilation? (2) The owner of the house whose windows are blocked has sent in a plan for rebuilding his house and bringing it forward to line of adjoining buildings, and this has been approved by the Rural District Council. It is stated that the land on which he proposes to bring forward his house belongs to the public, and the Council have no right to allow him to do so. The Parish Council acquiesce in the house being brought forward. Can the person who objects to the house being brought forward hold either the Rural or the Parish Council liable if this be built upon?"

Answer.—We doubt whether the Council would succeed in an action against the owner of the yard for blocking up the windows of his neighbour. The matter is a personal one, and the powers of the Act should not be utilised to remedy private grievances and quarrels. (2) Unless the land on which the proposed new house is to be built is indubitably a part of the highway; the person who objects has no remedy. The approval of the plan by the Authority in no wise renders them liable to any action at the instance of a person aggrieved.

2116.—Nuisance from Defective Drain: Written Application by Inspector.—"S. J." writes:—"I visited certain premises recently where a fever case existed, and found the drain traps defective. I wrote the owner requesting him to provide stoneware gully traps properly connected to the drain. The owner employed a builder to do the work, but when the man had opened the ground he found the drain in a very bad condition, and I was requested to examine it. The owner's attention was directed to the defect, and he was requested to make the drain good. He, however, refused, and ordered the trench to be filled up. I reported the matter to my Council, and as the drain was in such a bad condition they passed a resolution that seven days' notice, under Sec. 41 of the Act of 1875, be served on the owner, and that if he failed to comply with the notice, I was, on behalf of the Council, to get the work done. On his non-compliance with the notice I engaged a builder to do the necessary work on behalf of the Local Authority. Now, as the Local Authority did not receive a written application, as stated in the section, will this prevent our recovering the expenses incurred in doing the work. Can you state any case bearing on the point?"

Answer.—The Local Authority should be enabled to recover the expenses incurred. The written application referred to does not exclude the Inspector from being a person who can give it, and as he has doubtless furnished a report in writing in his journal or otherwise, this would be sufficient. In the event, however, of the defendant's solicitor raising a technical objection to the written application, the provisions of Sec. 262 of the Act, which provides that "no rate, order, conviction, or thing made or done, or relating to the execution of this Act, shall be vacated, quashed, or set aside for want of form" should not be overlooked.

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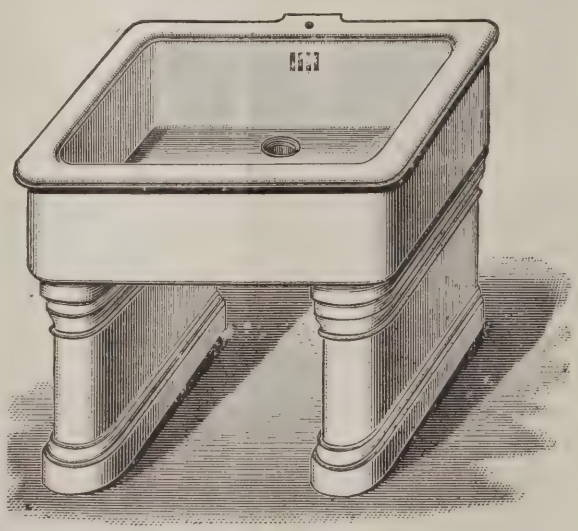

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PUBLIC LIGHTING BY GAS & ELECTRICITY

By W. J. Dibdin, F.I.C., F.C.S.,
Late Chemist and Superintending Gas Examiner to the Metropolitan Board of Works and the London County Council.

(*Continued from page* 137.)

CHAPTER XVII.—MEASUREMENT OF CURRENT.

In order to measure a current of electricity, two instruments must be used, namely, the *ammeter* for measuring the quantity of electricity conveyed in the current, and the *voltmeter* for measuring the potential or pressure of the current.

These two instruments are connected up to the circuit in the manner shown in the diagram, Fig. 32.

There are many other instruments in use, such as *voltameters*, for measuring the actual quantity of electricity supplied to consumers, registering this like gas by a gasmeter; *wattmeters*, for measuring electrical power, and registering this like a voltameter, but—unlike the voltameter—taking both the volts and the ampères into consideration; *ohmmeters*, for measuring the resistance of conductors, &c. &c. But it is beyond the scope of these articles to enter into a description of these; consequently we will restrict ourselves to describing very briefly the voltmeter and the ammeter only, and the manner in which these two instruments are connected up to the circuit, as this is of importance in order to more fully elucidate the action of the electric current in a circuit.

The ammeter is connected directly in the circuit, so that the whole of the current used for the lamps or motors has to pass through it, and consists of a needle pivoted over a graduated scale in such a manner that the current passing through a *short thick* coil of wire of low resistance is utilised for deflecting the needle by the magnetic lines of force which it produces.

The voltmeter, on the other hand, is not connected directly in the circuit, but is connected to it at two points, one on the positive, and one on the negative wire, by a separate wire; and measures the difference of potential between those two points, usually close to the terminals of the dynamo. The voltmeter is often exactly similar in construction to the ammeter, with the difference that a very *long thin* coil of wire of high resistance—often many thousand ohms—is used instead of a short thick coil. In the case of Cardew's voltmeter, however, the deflection of the needle is brought about by the expansion of a long thin platinum wire caused by the heat produced as the current passes through it; but in all voltmeters the current has a very high resistance to overcome, so that only a very minute quantity passes through the instrument.

It is of inestimable value to electrical engineers that a circuit may be divided at any point, and joined together again by any number of conductors, and the current will not, as might be supposed, flow along the line of least resistance only, but it will flow along each conductor exactly in proportion to its conductance; that is, inversely in proportion to its resistance. If the resistances of two conductors be R and r, their conductances will be reciprocals of these values, or $\frac{1}{R}$ and $\frac{1}{r}$ respectively; their joint conductance will be the sum of their separate conductances, or $\frac{1}{R} + \frac{1}{r}$, and their joint resistance the reciprocal of this value, or $\frac{Rr}{R + r}$.

It is clear that the joint resistance of two or more conductors will be less than the resistance of either conductor singly, for the two conductors together present a greater area along which the current can flow than a single conductor, in the same way as there will be less resistance to the flow of water in a tin can with two holes in the bottom than in a can with only one hole, whose area is less than the joint area of the two holes; and provided the height of the water or the pressure of the water in the two cans is the same, the can with two holes in the bottom will conduct more water in a given time than the can with only one hole.

If R represents a resistance of 3 ohms, and r a resistance of 2 ohms, their conductances will be $\frac{1}{3}$ and $\frac{1}{2}$ mho respectively; their joint conductance will be $\frac{1}{3} + \frac{1}{2} = \frac{5}{6}$ mho, and their joint resistance $\frac{6}{5} = 1\frac{1}{5}$ ohms.—Note: The term *conductance* is used as the inverse of resistance, and *mho* as the inverse of ohm.

Let us now briefly examine the course of the current in the circuit represented in the diagram, Fig. 32, in order to arrive at some explanation of how one instrument measures the ampères of the current while the other measures the volts. At the commencement of this chapter we explained that the current flowing

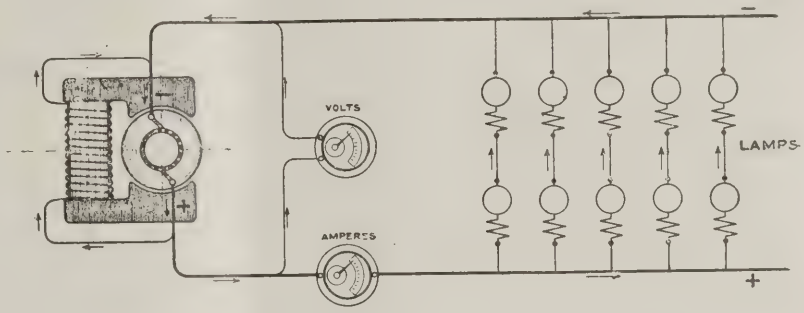

Fig. 32.

through a conductor measured in ampères is equal to the electromotive force of the current measured in volts divided by the resistance of the conductor measured in ohms; thus ampères $= \frac{\text{volts}}{\text{ohms}}$ or $C = \frac{E}{R}$.

Referring to our diagram, we will assume that the dynamo generates a current of 100 volts pressure, and that the voltmeter has a resistance of 5000 ohms. Assuming that all the lamps are switched off, the current which the dynamo will generate is dependent on the resistance of the voltmeter only; thus $C = \frac{100}{5000} = 0{\cdot}02$ ampères; but no current will flow through the ammeter, in consequence of the circuit between that instrument and the generator being broken; for the connection between the positive and negative wires is made only when the lamps are turned on, excepting between those points where the voltmeter is connected.

Let us now turn on the first pair of lamps, which have a joint resistance of 10 ohms. There are then two connections between the positive and negative wires, the voltmeter circuit having a conductance of $\frac{1}{5000}$ mho, and the lamp circuit a conductance of $\frac{1}{10}$ mho. Their joint conductance will be $\frac{1}{5000} + \frac{1}{10} = \frac{501}{5000}$ mho, their joint resistance $\frac{5000}{501} = 9{\cdot}98$ ohms, and the current which will flow through it with the pressure of 100 volts, $C = \frac{100}{9{\cdot}98} = 10{\cdot}02$ ampères. Of this current the

lamps will take $C = \frac{100}{10} = 10$ ampères, and the voltmeter the remainder, or $\frac{100}{5000} = 0{\cdot}02$ ampères; exactly the same as when the lamps were switched off.

In the same way, if the five pairs of lamps are turned on, there will be six connections between the positive and the negative wire, with a total conductance of $\frac{1}{5000} + \left(\frac{1}{10} \cdot 5\right) = \frac{2501}{5000}$ mho, and a joint resistance of $\frac{5000}{2501} = 1{\cdot}9992$ ohms. The current which will flow through the resistance at the same pressure of 100 volts, $C = \frac{100}{1{\cdot}9992} = 50{\cdot}02$ ampères, of which the lamps will take $\frac{100}{2} = 50$ ampères, and the voltmeter 0·02 ampères, as before.

Supposing we increase the pressure of the current to 200 volts, then, when the lamps are all disconnected, the whole current will pass through the voltmeter, and its magnitude will be $C = \frac{200}{5000} = 0{\cdot}04$ ampère; that is exactly twice as great as when the pressure was only half as great, or 100 volts. Further investigation will show that the current which flows through the voltmeter varies exactly as the electromotive force or pressure of the current, and is quite independent of the total current generated, or of any resistance which may be switched on outside the voltmeter circuit.

(*To be continued.*)

SOCIETY OF ENGINEERS.

NOTES ON CERTAIN DETAILS OF DRAINAGE CONSTRUCTION.

By Gerard J. G. Jensen, Member.

(*Continued from page* 201.)

The prevention of the foregoing evils lies, of course, in the arranging of the waste pipes upon the more modern and more satisfactory plan under which the waste pipes are constructed in a similar manner to soil-pipes (see Figs. 7 and 9), with the obvious difference in the diameters of the piping, and their mode of discharge. Main waste pipes from baths, lavatories, and sinks should, and need, in no case exceed 2in. or 2½in. in diameter, and should, unlike soil-pipes (under which term it is convenient to include the discharge pipes of urinals and slop hoppers), discharge over surface traps. Attention may, in passing, also be drawn to the fact that it is desirable to provide long waste pipes with slip joints, in order that expansion and contraction of the piping—due to the discharge of hot water—may take place without injury to the stack.

Reference has already been made to the 18in. long channel, which it is not unusual to provide between the discharge end of a waste pipe and the gully trap, into which the waste water is eventually conveyed. This channel is recommended in the model bye-laws of the Local Government Board, and certainly served a useful purpose, when it was the usual custom to leave fittings within the house untrapped. It then minimised the risk of entrance into the house of any drain air which, from some cause or other, might find its way through the water seal of the gully trap. Similarly, it reduced the quantity of foul air drawn into the house from decomposing deposits in the miniature cesspool, which then served the purpose of the modern syphon surface trap. At the present day the channel is, however, only, if at all, useful when waste pipes are constructed in the reprehensible manner described, that is, when the waste pipes are provided with open hopper-heads. In that case, should foul air pass the seal of the surface trap, only a proportion thereof will be drawn up the waste pipe, and liberated through the hoppers near windows. The remainder of the air will be excluded from the pipe by being discharged into the open air near the surface trap. Whether this is really advantageous is open to serious doubt. If there be any advantage, it is a

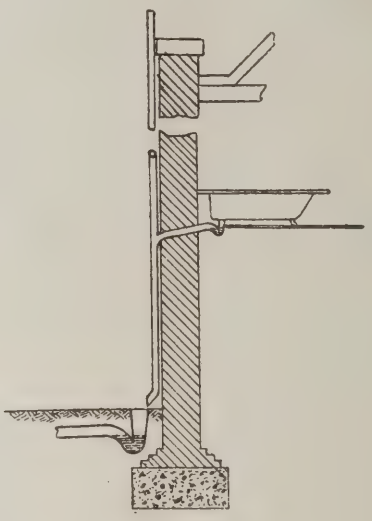

Fig. 9

question which is preferable, the remote risk of foul air passing the surface trap, and being drawn into the improperly-constructed waste pipe, or the almost certainty of a nuisance being created by decomposing deposits on the surfaces of the channel.

It may be urged that the channel should be periodically cleaned by hand. This certainly is done by the

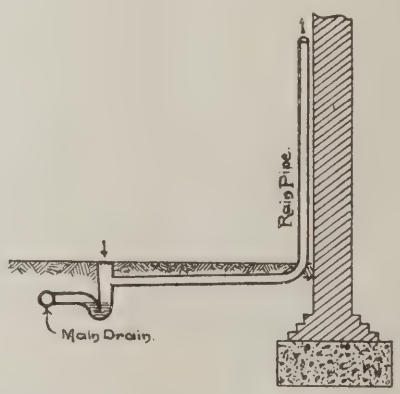

Fig. 10

few; but we have still to arrive at the time when the majority of householders will give even a thought to the condition of the drains, or bestow the care which the drainage system undoubtedly deserves. Happily the channel may be safely dispensed with under the system of waste-pipe construction advocated by the author, and if the waste pipe is properly connected to the surface trap, then not only will there be no danger from any foul air drawn into the waste pipe, but in addition, any foul air passing through the seal of the trap will be drawn into the pipe, and by it liberated at a safe point well away from all windows.

Whilst on the subject of waste pipes, the author desires to draw attention to a detail of construction

which he has now for some years adopted in his own practice, and which, although made public elsewhere by him, does not yet seem to be generally known or adopted. Under the present practice of secondary disconnection, by which a surface trap is provided at the foot of waste pipes and rain-water pipes, it frequently occurs that a comparatively long branch drain is left unventilated; the branch drain referred to being that connecting the surface trap with the main or other

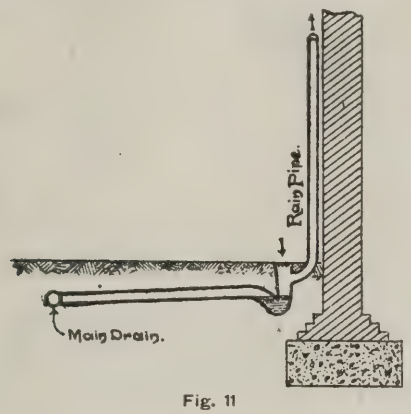

Fig. 11

branch drain, in which there is a current of air. If of appreciable length, such an unventilated branch drain is contrary to the principles of sanitation. On the other hand, the provision of a separate ventilation pipe for each such drain would be both costly and unsightly. A solution of the problem lies in placing the surface trap in proximity to the main drain, and continuing the waste or rain-water pipe to it underground. This will also avoid a 4in. branch drain which, in the majority of cases, is insufficiently flushed by the discharges of the waste pipe which it serves. The

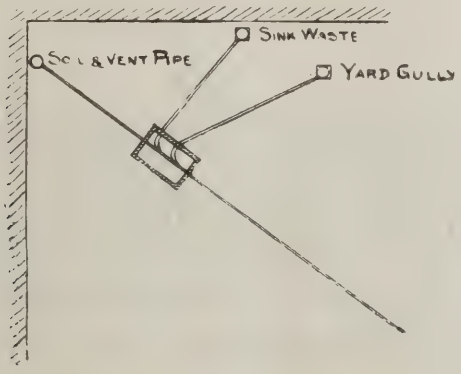

Fig. 12

method advocated is shown in Fig. 10, whilst Fig. 11 shows the alternative to be avoided. In continuing the waste pipe underground to the surface trap, it is, however, desirable to provide a cleansing eye—not shown in the illustration—at the change of direction in the waste pipe, in order that obstructions may be easily removed should they occur.

This plan of regulating the positions of surface traps with a view to the more perfect ventilation of the drainage system is equally applicable to manholes, the positions of which are not always chosen to the best advantage. Fig. 12, for example, shows the position, relative to drain inlets, which manholes frequently occupy. The arrangement, the author submits, could be greatly improved upon by constructing the manhole in the position shown in Fig. 13. By this means, in this instance, two unventilated and badly-flushed branch drains will be avoided. A slight saving in the quantity of drain piping used will also ensue.

In the construction of the manholes themselves, some improvement might frequently be made. Manholes are provided to give access to the drains, yet it is not unusual to find them so constructed that, for want of room, the drains discharging into them can only be reached by lowering a man down head foremost. This is a position in which, unfortunately, most men refuse to work. Again, a shallow chamber may have been built of sufficient size, but provided with such a small cover that a man wishing to plug the drain finds that,

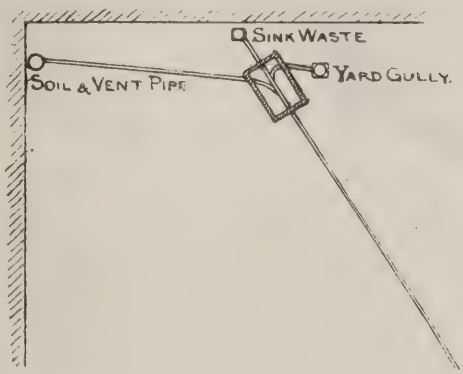

Fig. 13

by leaning into the chamber and balancing himself most uncomfortably on one hand, he can with the tips of the fingers of his other hand reach to just within an inch of the drain to be plugged. A third, and even more frequent mis-arrangement, is where the branch drains have been taken into the manhole near its outlet, leaving insufficient room for the insertion of drain rods, should that be necessary, for there is a limit to the pliability of these rods.

As regards the channels of open manholes—that is, of manholes in which there are no access pipes (Fig. 14)—these are perhaps best constructed of concrete properly rendered in cement. If, in addition, the whole of the interior surfaces of the manholes are similarly rendered, there is a greater possibility of

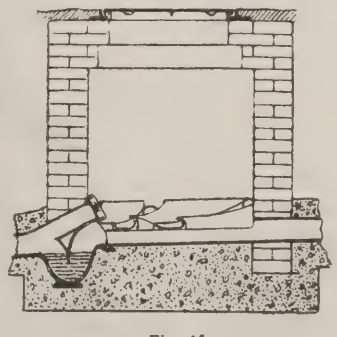

Fig. 14

obtaining a water-tight structure than if glazed channels and bricks are used. Unfortunately, however, the proper formation of the channels appears to be an utter impossibility with a great number of bricklayers, and if only such men are available, then certainly the best results are obtained by making use of suitably-shaped glazed channels. Attention must also be bestowed upon the channel benchings, since, if too flat, they will tend to collect deposits; while, if too steep, they will be difficult to stand upon.

Coming now to spigot-and-socket drain joints, it may be said that these are almost invariably made by insert-

ing some strands of gasket into the bottom of the sockets, and filling up the latter with cement or molten lead, as the case may be. The object of the gasket is, of course, to prevent the jointing material from entering the piping. Its employment, however, is, the author submits, not only unnecessary, but, what is more, most undesirable.

The gasket, being an organic substance, is found to decompose rapidly when moistened by sewage, and to sooner or later disappear altogether and leave a hollow space at each joint for the retention of sewage. This, of course, is opposed to the principles of sanitary drain-

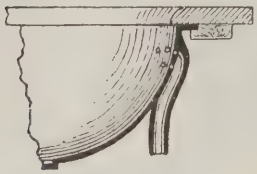

Fig. 15

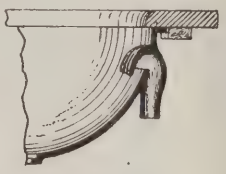

Fig. 16

age. Whilst the gasket lasts, moreover, it will also tend to harbour bacteria, which, in the case of pathogenic bacteria, is a serious matter, since the germs will multiply enormously in the meshes of the hemp. The joints may be well made without the use of gasket. In the case of cement joints, little more than care on the part of the workman is necessary to prevent an accumulation of cement in the piping, for, should it find its way into it, it can be easily removed before setting by the employment of a "badger." In the case of joints on iron piping, a few twists or ribbons of lead, or a cast lead ring, well caulked into the bottom of the socket, may be successfully substituted for the gasket.

The author lastly desires to draw attention to the overflows of the fittings of baths, lavatories, and sinks, some of which overflows render insanitary the fittings which are provided with them. The author refers to the overflows formed by holes in the sides of the fitting—

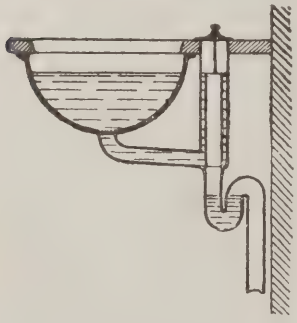

Fig. 17

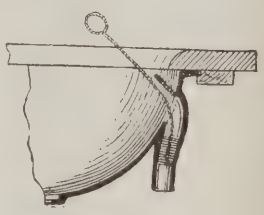

Fig. 18

see Fig. 15—to those in which the overflow pipe is masked by a shell or other ornamental device—see Fig. 16—and to others known as "secret" overflows and wastes, of which a type is shown in Fig. 17. These overflows, being but rarely flushed, and always inaccessible for cleansing by hand, soon become offensive, and it is to them that the mal-odours—"musty smells"—frequently experienced in bath-rooms, and similar apartments, are ascribable. Why these overflows should continue to be manufactured and used in new work is, perhaps, one of the wonders of house drainage, for their evils must be patent to all.

Better, and equally inexpensive, overflows are those in which provision is made for cleansing by the insertion of a brush, as indicated in Figs. 18 and 19, and those which consist of a short detachable pipe placed over the waste outlet (Fig. 20). The last-named, which are made in great variety of form, may be bodily removed from the basin for cleansing, and are easily replaced. The fact of their being in sight generally ensures their cleanliness. A similar overflow of recent introduction, which is illustrated in Fig. 21, is even self-cleansing, since, to empty the basin, bath, or sink, it is necessary to partly push the overflow pipe into the waste, thus ensuring a flush of water both to the interior and

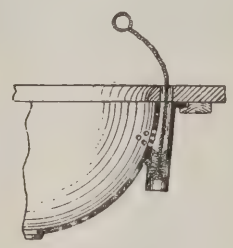

Fig. 19

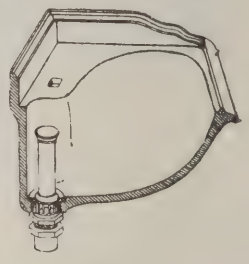

Fig. 20

exterior of the overflow pipe whenever the fitting is used. The author has of late frequently made use of fittings with these overflows, and has invariably found them to remain clean and efficient.

The author has now placed before the members particulars of what, in his opinion, are matters of considerable importance in the details of drainage construction, and has expressed his views thereon. He hopes his

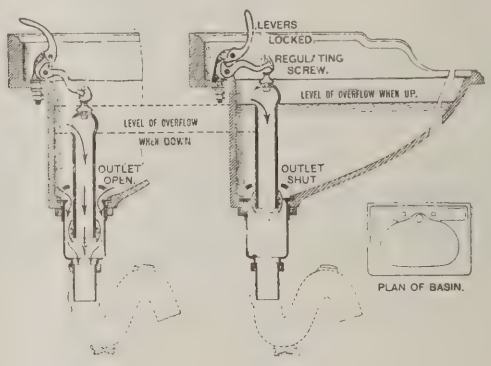

Fig. 21

paper will lead to a profitable discussion, in which the views and experiences of others will be given on these and any details not touched upon by him. He trusts that both the paper and the discussion may prove of practical use to those who, like himself, are engaged in that branch of the profession which deals with sanitation, and which, conscientiously and intelligently followed, is no whit behind any other branch in importance as regards the convenience and well-being of communities.

We shall give the discussion on this paper in our next issue.

THE Local Government Board has decided to issue a Provisional Order empowering the Drighlington Urban District Council to put in force the Land Clauses Act for the acquisition of land for sewage disposal works. The inquiry was held on January 30th before Mr. R. H. Bicknell, M.I.C.E. The District Council's proposal was strongly objected to by the owner, Sir R. Tempest. The scheme, as prepared by the engineer, Mr. John Waugh, C.E., of Bradford, provided for the whole of the drainage of the villages of Drighlington and Adwalton. The sewage on arrival at the Outfall Works is first treated in two large tanks by means of chemical precipitation, and then run on to four bacteria beds, the effluent from which is treated on five acres of land laid out on the intermittent downward filtration system. The total estimated cost of the scheme is £12,600.

TUBERCULOSIS—INFECTION, HEREDITY, PREVENTION, HYGIENIC TREATMENT.

By A. G. Young, M.D., Secretary State Board of Health, Maine, U.S.A.[1]

(*Continued from page* 176.)

At another of the congresses held in Paris for the study of tuberculosis, Dr. D'Hotel[27] gave the results of the study of outbreaks of tuberculosis in country villages in the northern part of France. The study was begun by his father and had been continued by the younger Dr. D'Hotel. The observations covered a period of more than half a-century. It is in the country that one can advantageously study tuberculosis with reference to the questions of infection and heredity, particularly in isolated country villages, where the inhabitants rarely change their habitations, and where there is but little communication with the outside world. Under these conditions the studies of the Drs. D'Hotel were carried out. The following are a very few of the series of cases of tuberculosis recorded by them :—

Observation 1.—The family X., father, mother, and three children, lived in a two-storey house. Previously no case of tuberculosis in the family nor in the house.

In 1884 a consumptive came to live on the second floor where he occupied two rooms, there dying at the end of six months. These rooms remained unoccupied. The owner's son stored wheat in them, and from time to time handled it.

In 1884 this young man, twenty-three years old, very strong, became tuberculous and died in seven months.

In 1886, thirteen months after, a younger sister, who had taken special care of him, and who had drunk and eaten with him, became consumptive and died in ten months.

In 1885, the eldest daughter of the proprietor, who was married and lived elsewhere, came to live in these apartments where the consumptive had died. She had four children, one boy and three girls; her husband was a strong man. During six months their health was exceedingly good, then the youngest child, a little boy of twelve months, strong and robust, who, until then had been healthy, but who spent one-half of his time on the contaminated chamber floor, now became sickly, and I observed an enlargement of the abdominal glands and diarrhœa. The child improved little by little, but the abdomen remained enlarged. The child had his teeth and walked, but remained delicate, and was subject from time to time to stridulous laryngitis. At times he coughed continuously and his mother said that for three months at a time he would be well and then he would have relapses.

When two years of age, I observed that the child had an enlargement of the left wrist, and at two and one-half years the left ankle became swollen. White swellings developed rapidly and suppuration occurred in three months. At the same time, the child became emaciated, coughed more and more, and died at three years, fifteen months after his uncle.

In 1886 a little sister, who sometimes lived in the apartments where the consumptive died, and sometimes in her sick uncle's room, had keratitis, which lasted for six months before any improvement. The next year keratitis appeared again, but was cured in two months. Since then her health has been good.

The other two children have remained well.

In 1890 the husband of the eldest daughter of the proprietor, with no hereditary history, had a continuous fever with pains in the joints, cough, oppression, on auscultation dispersed and transitory signs, diarrhœa, night sweats, hæmorrhages, emaciation. This condition lasted four or five months, then his appetite and health returned. This man, however, remained very pale.

Observation 3.—L. X., married a woman who became tuberculous and died in three or four years. One year later contracted a second marriage with D. X., in whose family there is no previous history of tuberculosis.

There was born to her one child, who lived. L. X. died of pulmonary tuberculosis at the end of four years He suffered about one year.

The second wife, D. X., had occasional febrile attacks in the year following her husband's death. In the second year of widowhood she married B. Z. Her health was rather poor, she had a husky voice without coughing much, and she took particularly good care of herself. Her husband had bronchitis and catarrh without any former history of these diseases in his family. He was an alcoholic. The son by her first husband lived to be twenty-five years old. He was brought up at home, but slept in the upper storey.

All the succeeding tenants occupied the same sleeping room, used the same bedding, and the furniture was not changed.

Observation 6.—Two tenements composed of two rooms under the roof. Two of the rooms were exceedingly low-studded; there were beds in all four rooms. By the doors being always open, these four rooms were really but one. The family was composed of the father, a strong man; the mother, a healthy woman, and nine children, all strong and well except two who died, one of diarrhœa at four months; the other, from the results of whooping-cough, all of which occurred a long time ago. Their maternal grandfather and grandmother died at sixty-four and sixty-five years of age, one of heart disease and the other of typhoid pneumonia. The paternal grandfather died at sixty-seven years, and the grandmother of typhoid.

No. 1.—It was in the midst of this family that a young commercial traveller died of consumption. He suffered from eighteen months to two years. He was the brother of the mother of these nine children.

No. 2.—During this young man's sickness a little boy two years old, who played continuously on the ground where the consumptive expectorated, was taken with tuberculous disease of the tibia and of the wrist which suppurated for six months, leaving cicatrices adherent to the bone, and destruction of a part of the second left metacarpal bone,

No. 3.—During the last five months of the uncle's sickness, a little girl was born. The invalid took particular care of this child. This child at three months began to have swellings on its wrists, shoulder, and thighs, which terminated in suppuration in three or four weeks each, white cicatrices remaining. At five months, abscesses recurred on the wrist, on the back of the hand, and on the scalp. These ulcers suppurated in about four months, leaving cicatrices adherent to the bone. There is partial loss of the fourth and fifth left metacarpal bones. This child had diarrhœa for two years, then was cured and now is six years old.

No. 4.—A girl, twenty-one years old, apparently in good health. One year after the uncle's arrival in the house, she was taken with enlargement of the submaxillary and cervical glands, with a cough and fistulas. She recovered and now her general health is good.

No. 5.—A son, twenty-three years old, well developed, hitherto perfectly strong, had hæmorrhages for three years. He has since died.

Observation 45.—X. and his wife, seventy-four and seventy years of age, had three children.

The first, a young seamstress sixteen or seventeen years of age, who had lived in the house mentioned in the fifth observation, died of consumption in twelve or fifteen months.

The second, a son twenty years old, died in five or six years, several years after the death of his sister.

[1] Reproduced, by special permission of the author, from the eleventh report of the Maine State Board of Health, U.S.A.

[27] "Congres pour l'Etude de la Tuberculose," 1893, page 64.

During this interval the second brother died of consumption also.

The father of these children, who had until then had robust health, suffered a great deal after his children's death. He had a number of attacks of hæmorrhage, and there were crackling rales at the apex of the right lung. His sickness lasted between ten and fifteen years, commencing from the death of his children. He has been well now for ten years. His father and mother died of old age.

This house consisted of a kitchen chamber with a dark closet attached, where each patient had slept in turn.

(*To be concluded.*)

INCORPORATED SOCIETY OF MEDICAL OFFICERS OF HEALTH.

BACTERIAL CONTACT BEDS AT SOUTH MOOR.

The ordinary monthly meeting of the members of this Society was held last Friday evening at the offices, 197, High Holborn, W.C. Dr. J. C. McVail, the president, occupied the chair, and those present included Drs. T. Eustace Hill, P. J. Allan, H. Kenwood, H. N. Richards, G. Millsom, T. Robinson, H. Beale Collins, E. F. Willoughby, F. E. Streeter, A. Newsholme, O. Field, E. H. Williams, A. N. Brind, Mr. W. Defries, &c.

The Council reported that they had arranged with the Royal Statistical Society for the meetings of the Society to be held at 9, Adelphi-terrace, W.C.

Dr. T. Eustace Hill, M.D., Medical Officer of Health to the County of Durham, read a paper on "Sewage Disposal Notes, with Special Reference to Bacterial Contact Filters." The subject of sewage disposal, he said, was one in which Medical Officers of Health must be interested, and for some time past he had been carefully observing the results obtained in certain sewage works. There had been and still is a difference of opinion respecting the best means of properly disposing of sewage, and it was a question affecting the public health interest. So far as he could ascertain, the problem had not been brought before the Society for some years past, and its discussion would not, therefore, be inopportune at the present moment. Although the question had long been interesting Medical Officers, it was only of late years that the proper conditions and agencies had been fully recognised. Dr. Hill then briefly traced the early history of sewage disposal by means of broad irrigation and downward intermittent filtration, chemical filtration, and precipitation. But in none of these processes was there any knowledge shown of the biology of sewage or the value of microbic action. Having referred to the Dibdin, Massachusetts, and Sutton experiments, he pointed out that it had been found that bacteria were capable of indefinite multiplication in sewage, and that bacteria existed in sewage capable of peptonising solid organic matter—a process comparable to that of digestion itself, and final nitrification. With the results of Mr. Dibdin's investigations into the periodical treatment of sewage on a comparatively large scale by passing it through filters of coke might be said to have commenced the revolution in the ideas of most chemists and sanitarians as to the disposal of sewage. It was then begun to be recognised that instead of destroying them, micro-organisms might be used as a chief factor in the purification of sewage. All disposal systems since brought forth have more or less depended upon microbic action for success. Dr. Hill then described later developments of the system, the Sutton beds, septic tanks, and so on, explaining the well-known principles upon which these experiments were based. He did not propose to enter into the relative merits of the various methods which could be mentioned, but to give the results obtained at South Moor, in the county of Durham, with bacterial contact tanks. Previously the sewage of the district had been treated on land and discharged into a river, the water of which lower down was used to partly supply another village with drinking water. The land available was quite inadequate for the proper purification of the sewage, and complaints were frequent. As a result of pressure, the District Council in 1898, on his recommendation, proceeded to construct on the land then being used for sewage disposal a set of bacterial contact tanks on somewhat similar lines to those at Sutton. The work was completed at the beginning of 1899, and occupied an area of about half an acre. The estimated population to be provided for in 1900 was 4560. The sewage was passed through a sort of detritus chamber, through a ½in. perpendicular screen into a collecting or subsiding tank, 35ft. by 29ft., and 5ft. in depth, and this held rather more than half the total daily flow of sewage. Thence it was discharged on to the coarse tanks, four in number, 45ft. square and 5ft. in depth; capacity, 85,000 gallons. The filtering material was a mixture of coke breeze and clinker, carefully screened, varying in size from 1in. to the proportions of a hen's egg; the four fine tanks were similar to the coarse tanks, except that the material was from ¼in. to 1in. There was no distribution of the sewage; it was allowed to run directly into the tanks. The tanks had been working continuously since February, 1899, without a stoppage. The raw sewage was first allowed to collect in the subsiding tank—it was a collecting tank rather than a subsiding tank—and after a few hours was run off into the coarse tanks. When the works were first started the liquid was only held up two or three hours, but in order to save attendance at the works during the night, the contents of the subsiding tank were run into the rough tank just before the attendant left the works, and remained there all night. No bad results followed the long contact, and it became the practice to allow the liquid to remain in dry weather in rough and fine tanks eight or ten hours; it was found a greater degree of purity was obtained than when it was only held up for two or three hours. The theory that the bacteria were drowned by long contact was thus found to be incorrect. Having explained in further detail the actual working of the tanks, which took all the storm water as well as the ordinary sewage, Dr. Hill explained that the detritus collected in the subsiding tank was very small, and was easily disposed of on a small plot of land twenty yards square without the slightest nuisance being caused. The effluent from the fine tanks was bright and sparkling and free from any trace of smell. Samples of the sewage and of the effluents were taken at all times with the result that it was proved that a satisfactory purification had taken place. On the average it was over 90 per cent. In the fine tanks, before bacterial action could have been said to have been properly established, the average of all samples analysed was:—Reduction of organic ammonia, 91·6; reduction by oxygen absorbed, 92·8. In May, 1899, the bacterial action had been fully established, and the results were still better according to the latest standards. The sewage had no manufacturing refuse, but the liquid was strong, urinous, and foul smelling. The population of the district was rapidly increasing, and with the present works the sewage from an additional population of 3000 could easily be dealt with. The total cost of land and tanks was £1450, or 7s. 3d. per head of the estimated population. This was paid for out of the current rates of the district, as the Local Government Board would not sanction a loan for the purpose unless there was provision made for passing the final tank effluent through land. The results of this work were sufficient to prove to the Local Government Board that land is unnecessary for bacterial sewage works, except in very special circumstances. The annual cost of maintenance did not exceed £30. The

points which had suggested themselves to him as a result of observations kept on the works were:—(1) That the passing of the sewage into a collecting tank before allowing it to run on to the coarse bed appears desirable, especially in small works, because distribution was more easily and quickly effected, less attention was required, but in no sense was that collecting tank a resolving tank; (2) the material employed did not appear to be of great moment, provided it was hard, not liable to break down into small particles or dust. In their case the breeze and clinker was obtained from local collieries for the cost of collection; the size for the rough tank appeared to be best at 1in. to the size of a small orange or less; for the fine tanks the material should be finer, although not too fine, as mistakes had in certain cases been made in this direction. Material which had passed a 1in. screen and been refused by a ¼in. screen was the most suitable material for fine tanks, and the results at South Moor made him doubtful whether any more suitable material than coke breeze could be obtained; (3) in neither coarse nor fine tank was there need for distribution over the surface; (4) contact tanks possessed advantages over some other systems where there is a constant flow of sewage through the tanks. Where there is a continuous flow distribution is improved. With regard to the reduction in capacity from the gradual depositing of mineral matter, Drs. Clowes and Dibdin had pointed out this reduction in capacity. At South Moor the same fact had been noted in regard to the coarse tanks. But there was no definite information as to the amount of reduction after two years' working; so far it was certainly not serious, and probably the tanks could continue working satisfactorily for several years without interference. Even in their case, if this reduction did seriously detract from the value of the contact beds, it would be an easy matter to put each one in turn out of order, and change the material in the tank; the greater part of the old material would be available, and the cost of screening would not be great. But this would never have to be done more than once in five years. There was no appreciable reduction of capacity in the fine tanks, nor was this likely to happen, for the effluent from the rough tanks contained practically no suspended matter. The period of contact of two or three hours laid down by Mr. Dibdin could be exceeded, and the sewage was held up eight, ten, twelve, or fourteen hours. With a strong sewage like that at South Moor probably the bacterial purification was more complete when the period of contact is from eight to ten hours than when held up only for two or three hours. At any rate, their percentage of purification was considerably higher than that at Sutton. A strong domestic sewage diluted to within six times its own bulk by storm water required one and a-half to two hours' contact in the tanks for sufficient purification to be obtained; therefore the capacity of the tanks must be such that a dry-weather flow can be, if desired, held up from eight to ten hours' contact. But the works at South Moor proved that ordinary sewage could be purified sufficiently in double-contact tanks. The change which the sewage underwent in the coarse tank appeared to be different to that which it underwent in the fine tank. The effluents from the coarse tanks were nearly black in appearance, and had a very characteristic smell, quite different from that of sewage; not only did it contain sulphuretted hydrogen, but there was a distinct earthy smell. He thought the change was largely an anaërobic change, similar to that in the septic tank, though undoubtedly in the upper portion of the bed the aërobic organisms would be at work. The effluents from the fine tanks were clear and bright, and contained large quantities of dissolved oxygen. With regard to automatic discharge apparatus, his experience with the various contrivances was not satisfactory. The chief objection to automatic apparatus was that it could not adapt itself to the changes in the flow of the sewage, and obviated that supervision which was so necessary in sewage disposal works. Among the objections to the double contact system one was the difference in level required being greater than in any other system. There must be a difference of 8ft. between the level of the sewage and the effluent, and if a collecting tank is used, as at South Moor, the difference is at least 12ft. In many districts that amount of fall is impossible. Another objection was that pathogenic organisms present in the sewage were also present in the effluent. Dr. Houston had shown that with regard to London sewage the B. coli communis and the B. enteritis sporogenes are nearly as numerous in effluents from coarse contact beds as in the sewage before treatment, and the effluents of double contact beds were also found to contain these organisms in large numbers, although to considerably less extent than the raw sewage. On the other hand, an efficient land treatment appeared to very considerably reduce the number of organisms. The danger of allowing an effluent containing pathogenic germs to flow into a river used for supplying drinking water was obvious. But further investigation into this matter was much needed, and in the meantime the Local Government Board were probably justified on insisting that the effluent from bacteria tanks and filters should pass through land or sand filters whenever the recognised watercourse was used as a drinking-water supply. He did not wish to be understood as advocating the bacterial contact system in preference to any other system which is capable of properly purifying sewage, but desired to give the results of his own experience, which showed that strong domestic sewage could be sufficiently purified in this way at moderate cost both for construction and maintenance.—Discussion followed, and a hearty vote of thanks was accorded to Dr. Hill for his paper.

NORTHAMPTON SEWAGE FARM.

A NUMBER of members of the Coventry City Council recently visited Northampton in order to inspect the Northampton Corporation sewage farm, which is regarded as amongst the best and most successful in England. Coventry has just established a sewage farm, and the object of the visit was to see the way in which the Northampton Town Council have laid out their farm, the manner in which it is conducted, the methods adopted for cropping, &c., and the results obtained. After the visitors had been conducted round the Town Hall and the Police-station, they were entertained to luncheon at the Grand Hotel, Northampton, by the Mayor. After a *recherché* repast, with his Worship in the chair, and Councillor Henry Green in the vice-chair, the loyal toast was honoured, and "Our Visitors" was proposed from the chair, and the visitors felicitously gave "The Mayor and Town Clerk." Subsequently carriages were ordered, and the company drove to the Houghton-road sewage works, which are soon to be removed. Leaving here, they proceeded to the Corporation sewage farm at Ecton. The whole of the arrangements at the farm were inspected, and interesting explanations were given by Councillor Green, Mr. Goosey, and Mr. Gubbins. The visitors expressed themselves as well pleased with all they saw, particularly with the effluent from the farm. When Northampton was again reached the company were entertained to tea at the Grand Hotel by Councillor Green, who was thanked for his hospitality. The guests expressed their gratification at their reception, and the courtesy they had received from every one they had met on their tour of inspection, and they congratulated the Town Council of Northampton upon the efficiency and condition of the sewage farm.

THE INSTITUTE OF SANITARY ENGINEERS

(Incorporated).

OFFICIAL TRANSACTIONS.

The following paper was read by Mr. J. Allan, Member, at the fourth meeting of the present session, February 13th, 1901, when Mr. W. J. Wells, chairman of Council, presided:—

FIREPROOF CONSTRUCTION FROM A SANITARY POINT OF VIEW.

I do not think that any apology is needed for asking your attention to-night to the subject of fireproof construction, as practical sanitary science has now become so wide in its application as to include every detail of construction which is likely to have a beneficial effect upon the health of the community at large; although nine years ago, when the first examination in practical sanitation was held at the Carpenters' Hall, one of the candidates, when informed by the Chairman of Examiners that his paper did not show sufficient practical knowledge of construction to warrant them troubling him further, declared that he considered the examination more like one in building construction than sanitation.

In dealing with this subject, I wish to point out at the commencement that I use the word fireproof as it is ordinarily used and understood, and do not intend to raise the question as to what is and what is not fireproof, but to take the word as it is used and understood in the various bye-laws and regulations, viz., walls, floors, partitions, and roofs composed wholly or in part of incombustible materials; and I shall assume that all external walls are so constructed, and confine my remarks to floors, partitions, and roofs.

I think that fireproof construction has not received in the past, nor receives at present, from sanitary experts the attention it deserves. There can be no doubt that buildings, when the floors, partitions, and roofs are composed of incombustible materials, are much more sanitary than those with ordinary wood floors (with or without pugging), stud or quarter, or even brick-nogged partitions, and that buildings so constructed are and can be brought to a greater state of perfection from a hygienic standpoint.

No doubt the additional cost has in a great measure prevented the adoption of fireproof construction in ordinary dwelling-houses; such a thing is rarely met with except in the modern flats, where it is compulsory under the Building Acts, or in private residences, where cost is no object.

About eighteen months ago the writer was asked to get out an estimate showing the difference of cost between an ordinary wood floor for workmen's cottages, and a concrete floor finished with floor boards on the top and plastered ceiling below. The fireproof floor worked out at 45 per cent. to 50 per cent. higher cost than the ordinary wood floor composed of 3 by 9 joists, 1in. floor boards, and lath-and-plastered ceiling, over spans of 20ft. by 15ft.

The extra cost led to the abandonment of the idea, and ordinary wood floors were used. I believe that the difference in cost now would be from 55 per cent. to 60 per cent., owing to the increased price of steel joists.

One serious item in the cost of fireproof construction is the expense of the temporary centering, unless there are large quantities where it can be used several times over, and thus reduce the cost by spreading it over a large area. Still, I think that, notwithstanding the extra first cost, the question is worth our serious consideration, when we take into account the increased healthiness of the community as the result of more sanitary dwellings, the absence from danger of fire, and the less cost of repairs, all of which would follow from the adoption of fireproof constructed houses.

It is hardly necessary for me to give you a description of the general condition of the spaces between the joists, floor boards, and ceilings of an ordinary dwelling-house, after, say, ten or fifteen years' occupation, but, for the sake of contrast, let me occupy your attention on this point for a few minutes.

Those who have had occasion to cut openings in the floors of ordinarily built houses know what a mass of dust and dirt accumulates in the course of a few years in the spaces between the joists, floor boards, and ceilings, and which is, in the nature of things, a hotbed of disease germs, and a standing menace to the health of the occupants, and this dangerous mass is being continually added to every time the rooms are cleaned, by particles being forced through the joints of the floor; and in bedrooms where a case of infectious disease occurs, with the present system of wood floors, the danger from germs thus stored is greatly increased. No doubt the dangers I have alluded to can be, and are, guarded against to some extent by using tongued floor boards, but even then the accumulation of dust and germs will still be found to exist, and the spaces between the joists are the happy hunting-ground of rats, mice, beetles, and other domestic pests.

What I have said about the ordinary wood floors applies to a certain extent to the usual stud or quarter partitions. It is surprising the amount of dust and dirt that is to be found in the interior between the studs, which, like the space under the floors, becomes a hotbed of disease germs. These partitions are somewhat improved if the spaces are filled in with brick nogging, but even then they do not, in my opinion, form a desirable construction from a sanitary standpoint, as the plaster is liable to crack at each stud, and the cracks form receptacles for dirt and microbes.

With regard to roofs as usually constructed, they are liable to the same defects as already described, only that the dust mainly comes from the outside, and finds its way into the rooms through every chink and crevice, carried there by the air currents due to the difference in temperatures.

Having described briefly the sanitary defects of floors, partitions, and roofs, as ordinarily constructed, I will now endeavour to show how some of these may be obviated, or at least minimised.

In considering the use of concrete for floors and roofs, we are dealing with a very old form of construction, which was known to the Romans, and much used by them over nineteen centuries ago. Professor Middleton in his first book, "Ancient Rome," states that the whole of the upper floor of the "Atrium Vesta" was formed of a great slab of concrete 14in. thick, and about 20ft. span, being only supported by its edges, having no intermediate supports. In his second book, "The Remains of Ancient Rome," Professor Middleton mentions that the Romans used concrete for the construction of the Pantheon (which was erected about the beginning of the Christian Era), including the great dome, which is 142ft. diameter and 37ft. high, so that, although practically unknown in this country a century ago, it is really a return to an old system I am now advocating.

As to the many forms of patent fireproof floors time would fail me to describe them in detail, so that I will content myself by mentioning a few of the best known systems which are in use at the present time. Before doing so, I wish to call your attention to two sketches, which show, might I say, the maximum and minimum of strength and simplicity of construction. A diagram was shown of a section to a scale of one-twelfth full size of the floors, and mansard roofs of the new buildings recently erected at the Royal Observatory, Greenwich. The width between the walls is 22ft., which is spanned by 14 by 6 rolled steel joists of heavy section, placed from 3ft. 6in. to 6ft. 6in. apart to suit the piers of brickwork between the window openings, and arches are formed as shown,

the minimum depth at crown being 7in., and the maximum at haunches 13½in., with a rise of not less than 1in. per foot of span. The concrete is composed of hard coke breeze and Portland cement, gauged 5 to 1, the top or wearing surface of floor being finished with a hard trowelled granolithic face. Another sketch gave a section one-twelfth full size through the floors of the cloak-rooms, lavatories, and teachers' rooms of a public school, constructed to carry 2 cwt. per foot super, the span of floors being 20ft. 6in. by 13ft. 6in. in clear of walls, the space being divided the long way into three bays by 6in. by 5in. by 26 lb. per foot R.S. joists, on which were laid 3 by 1½ R.S. joists at 2ft. 3in. centres. The small joists were so placed in the thickness of the floor that there is 1in. thickness of concrete under them and 2in. on the top, the top 1½in. being composed of granolithic. The remainder of the concrete is composed of hard coke breeze and Portland cement, gauged 5 to 1, the 6 by 5 joists being incased in similar concrete, minimum thickness 1½in. The floors of caretaker's rooms are constructed in a similar manner, but the concrete is composed of coke breeze the full depth, on which are nailed wood fillets, to which the floor boards are nailed. The wood fillets, in my opinion, were unnecessary, as the floor boards could have been nailed direct to the coke breeze concrete, or better still, the concrete finished with a hard granolithic face, same as other rooms, which would have saved space, made a better job, and been cheaper.

The floors I have just described are such as can be made by the ordinary workmen employed by a builder.

I will now briefly describe some of the best known and most widely used patent systems of fireproof construction, which can only be carried out by the patentees or under their licence.

During the first half of the nineteenth century several attempts were made and numerous patents were taken out for fireproof floors, but not until Dr. Fox introduced what was afterwards known as Fox and Barret's floor was there anything that proved reliable or lasting. Since then we have Wilkinson's, Dennett's, and Dawnay's floors, all of which consist of rolled steel joists and Portland cement concrete in various forms. More recently we have Fawcett's, Homan's, Picking's, and Ward's floors, which are all of the lintol form of construction, being composed of fireclay, or gypsum tubes of different forms, which are notched at the ends, so as to rest upon and protect the lower flanges of steel joists, and are filled in to the required depth with Portland cement concrete, and finished on the top as required to take floor boards, mosaic, or granolithic.

Then there are Potter's arched floors, and the "Cunnah-Wright" system, where the steel joists are fixed further apart with corrugated sheets placed between, to carry the concrete in lieu of the fire-clay tubes. In the former the sheets are curved as well as corrugated, thus forming a series of arches, while the "Cunnah-Wright" sheets are flat, and have peculiar dovetail-shaped corrugations or grooves, which strengthen the sheets, and form a key for the plastered ceiling. Then we have Stuart's granolithic floors, Potter's flat floor, Banks' floor, the Expanded Metal Company's floor, Hayward's floor, and most recent of all, the Columbian Fireproofing Company's floor, with their special ribbed steel bars, which aim at using the minimum of steel with the maximum of strength, and succeed in a remarkable manner to do so. Especially is this accomplished in Stuart's floor, where the results are marvellous for the bulk of material used.

You will notice I have divided the floors mentioned into groups. Group 1: These floors are too heavy and costly to ever become generally used, and do not call for any special commendation. Group 2: These floors are more generally used, and are well known. Picking's floor, I think, is the best of the group, and is most suitable for general adoption in ordinary dwelling-houses because of its lightness, the small space it occupies, as well as being moderate in price. I think all this group would be improved if the tubes were made longer, so that fewer joists could be used, and thus the cost reduced. Messrs. Picking and Co. make a special arched form of tube for spans up to 3ft. 6in. between the joists, which deserves attention. Group 3 I think are still more suitable for general use, as they can be adapted to any class of building, and work out at moderate cost. Group 4 I consider the best of the floors now in use, and are likely to be more generally used in the future. Stuart's granolithic floor seems to me to be the best, from a hygienic standpoint, when the top of the floor is to be the wearing surface; but when small fillets or joists are used for the purpose of securing the floor boards, it again introduces the space between the floor boards and the top of the granolithic, which we want to get rid of.

Potter's flat floor, with corrugated steel rods, I think deserves attention for ordinary dwelling-houses. It takes up little space, is light, and can be finished with hard wearing face, or floor boards, nailed direct to the concrete. I have provided, as far as I could, some particulars and illustrations of the several systems of floors as published by the patentees, and must refer you to these for further details of the different floors.

I will now ask your attention for a short time to the construction of partitions. Fireproof partitions have not received anything like the amount of attention that floors have done, and there are not many systems in use.

When cost is no object, a 4½in. or 9in. brick wall can always be recommended, provided the plans of the various floors are arranged symmetrically, so that the walls come over each other to take the weight. There are several special bricks in use for partitions, which can be used in conjunction with fireproof floors, Picking's being specially worthy of notice. They are light, rigid, and take up little space, and can be had with glazed faces, plain faces for painting, or left with grooved surfaces for plastering.

The Cunnah-Wright system of partitions deserves attention as one of the best now in use. From particulars given it seems to be a sound and substantial form of construction, and is being largely used. This partition consists of their special corrugated sheets, fixed into a special section of H steel standards with channel cills and T heads, plastered both sides, finishing about 2½in. thick.

The Expanded Metal Company and Hayward Bros. both claim lightness and economy of space for their partitions, but I have a doubt as to their rigidness, unless stronger standards are used. They consist of light steel rods, secured top and bottom to the floor joists, tightened by screws, to which is fixed expanded metal lathing in the former, and Jilhmil lathing in the latter, but if any sag takes place in the floor overhead the tension of the rods would be destroyed, and the stability of the partitions endangered.

Potter's partitions are composed of light concrete, with corrugated steel rods embedded in same; but they require temporary boarding, as the concrete is filled in *in situ* in a soft state. They are very suitable for partitions which do not go the full height from floor to ceiling, such as are used for cubicles, &c.

With reference to roofs, the various systems of construction used for floors can be, with little variation, applied to roofs—which can be flat and asphalted, or mansard with the sides slated or tiled, the slates or tiles fixed direct to the coke breeze concrete, and the flat portion asphalted, or otherwise made weather-proof.

In conclusion, the ideal dwelling-house, from a sanipoint of view, ought to have fireproof floors, finished with hard cement surfaces, without floor boards; the

kitchen and other offices left bare; bedrooms to have a few loose mats or rugs where necessary. The floors of the other rooms could be covered with some of the various kinds of cork carpet, or lino, or ordinary carpets could be fixed by using lead or oak plugs, as necessary. (I have seen this done in theatres, where all floors were finished with cement surfaces.) Solid fireproof partitions, with all angles at junctions of walls and floors rounded, and finished with hard plastered surfaces, including the main walls, and painted and decorated in oils, in preference to wall paper or distemper colours. The upper floor, if the roof is not fireproof, ought to have a concrete fireproof ceiling, which would vastly increase the comfort of the rooms, rendering them cooler in summer and warmer in winter.

It may be said that what I have described is only an ideal, and not practical; to which I reply that what I have just described is being carried out to a certain extent in all modern hospitals, asylums, and workhouses, and surely it would be truer political economy, to provide properly-constructed sanitary houses for the community at large, to keep them in health, and prevent disease, than to provide *such only* for those who are suffering from disease, sickness, or old age, when by doing so health and strength would be preserved, and the arrival of infirmity from disease and old age delayed; and further, such methods of construction are being carried out in America, as the following extract, from a very courteous letter I received on this subject from the manager of the Columbian Fireproofing Company, Limited, will show:—"One building in Indianopolis ('The Majestic'), one of the finest in the West, has no wood floors, and the offices are very comfortable to sit in. This building was built particularly from a sanitary standpoint, as it is owned by a doctor, who objected to wood floors on the ground of dirty water, &c., getting into the joints."

In bringing these notes to a close, I wish to acknowledge my indebtedness to the following for their courtesy in giving me information, and placing at my disposal the various samples and photographs which you see here to-night:—Stuart's Granolithic Company; Mr. Thomas Potter, of Potter and Co.; Mr. G. C. Picking; the Fireproof Partition Syndicate, Limited (Cunnah-Wright Patents); Hayward Brothers and Eckstein, and the Expanded Metal Company.

DISCUSSION.

The CHAIRMAN, in rising to propose a vote of thanks, said:—

The subject of the paper which Mr. Allan has so ably placed before us this evening is one which must appeal very forcibly to those who are desirous of adopting the best form of construction for floors and partitions to dwelling-houses, both from the standpoint of sanitation and fire resistance. There can be no difference of opinion as to the desirability of abolishing the old system of flooring and quarter partitions, forming so many receptacles in their vacant spaces for objectionable matter of every description. The difficult problem appears to be to find some mode of construction by which the well-known evils of the old system can be avoided, and, at the same time, to obtain those results at a cost which will admit of a fair interest on the outlay. Many of the examples we have before us without doubt are excellent, and for flats and other large buildings a sufficient rent could be obtained to justify the necessary expense, but in the case of moderate-sized dwelling-houses and of dwellings for the working classes the extra cost of 50 per cent. would appear to be a serious item, and the necessarily increased rent required to obtain interest on the capital would be considerable. Looking at the question from a health point of view, it would doubtless be to the interest of the occupants to pay the increased rent, and in all probability it would be economical in the long run, but I fear the average workman would not see the matter in that light. One objection in some of the fire-resisting floors is the space left between the surface of the concrete and the under side of the floor boards, and I think it is far better to fix the flooring direct to the concrete with no intervening space, placing a thin coating of damp-proof composition between boards and concrete. With these few remarks, I beg to propose a vote of thanks to Mr. Allan for the care he has taken in preparing the matter for our discussion.

In seconding the vote of thanks proposed by the Chairman, Mr. F. J. RAYNER said he must personally thank Mr. Allan for his very able paper, as it was one he had looked forward to, being a matter he had taken a special interest in for some time. Mr. Rayner agreed with the reader that the subject is one that should be more thoroughly dealt with by sanitarians, for fire-resisting floors and walls were highly conducive to cleanliness, and prevented to a vast extent the gathering and multiplication of disease germs, as compared with wood floors and papered walls.

Mr. H. M. DOVE had much pleasure in supporting the vote of thanks. He would like to mention that flooring composed of coke breeze concrete was not considered by many district surveyors as being of fireproof construction, and that where it was requisite that fireproof flooring or staircases had to be constructed, they required the sanction of the London County Council before they would allow the use of coke breeze in the concrete, as it was not proof against fire, it allowing heat to be freely transmitted and conveyed to surrounding material. As to the space mentioned as usually existing between the upper surface of a concrete flooring and the joists and wood flooring above, he now usually got over that difficulty by using dovetailed-shaped joists, covered with tar, &c., and embedded them in the concrete, so as to be of the same finished surface, upon which he spread a coating of pitch and tar, or asphalt, and laid the flooring directly upon same, thus doing away with the open space, and obtaining the advantage of a wood block floor at a much lower cost. He would also mention that concrete formed as an arch was not of the nature of an arch, but only as a slab of unequal thickness, and that if a slab of the average thickness of the arch were laid in one thickness, greater strength would be obtained, and at a slightly less cost, owing to a level surface having to be found in the place of the usual arched centerings. It was impossible to form an arch of ballast and cement in a dry state, as could be done with bricks, stone, or blocks. Therefore the whole of the strength was in the material used to bind the ballast into one mass, the strength being that of tension and cohesion, and not compression.

After several other members had spoken, the vote of thanks was put and very heartily carried.

In acknowledging the vote of thanks, and replying to the remarks made, Mr. ALLAN said he quite endorsed what Mr. Wells had said about the cost being the great barrier, which hindered the introduction of fireproof construction in ordinary dwelling-houses, and regretted that at the present time, when so much was being done to solve the problem of housing the masses, that the extraordinary increase in the cost of labour during the past ten or twelve years made the solution so much more difficult. Not that he grudged the payment of fair wages, but he deplored the ever-increasing difficulty of obtaining anything like a fair return of work for the wages paid. In his opinion the London County Council were mainly to blame for the present state of matters, owing to their having practically backed the trade unions by insisting upon a uniform rate of wages being paid without any regard to the amount of work done in return. The fact that it had become a general practice for all public bodies following in the wake of the London County Council to insist upon a certain rate of wages

being paid, without any regard to the amount of work done, was nothing less than robbing one-half of the ratepayers for the benefit of the other. He considered that there ought to be a standard fixed for the amount of work to be done as well as the rate of wages to be paid. If this were done he was sure it would go a long way in solving the housing question. Everyone who had to do with the carrying out of work knew that while the rate of wages in the building trade in London had been increased about 12½ per cent. during the past ten or twelve years, the actual cost of labour had increased 30 to 40 per cent. In reply to a question by Mr. Dove as to why the floor, shown by Fig. 1, was arched, as he considered it would have been just as strong if made flat, the thickness of the thinnest part, Mr. Allan said that he was not responsible for the section shown, but he differed from Mr. Dove, and considered that the arched form of floor was the strongest and best for the bulk of materials used; in proof of which he read an extract from a report by Mr. Baldwin Latham, on the fall of some concrete floors at Cambridge, where he says that "concrete floors between iron girders should be cambered or curved, so that the strains may be in compression and not in tension."

WEDNESBURY SEWAGE FARM.

We are indebted to Mr. T. Wicks, A.S.I., engineer and superintendent of the borough of Wednesbury sewage farm, for the following details of its working:—The dry-weather flow of sewage is from 500,000 to 600,000 gallons per twenty-four hours, and the maximum flow of storm water from 3¾ to 4 million gallons. Two-thirds of the sewage flows to the works by gravitation, the remaining third is raised by four of Shone's pneumatic ejectors, which are located at the "low levels" of the town, and are operated by compressed air conveyed in pipes from the works. The sewage is brought down to the works by a cast iron main outfall sewer 2ft. in diameter, and is discharged into a screening chamber where two screens of ½in. and ¼in. mesh are located. Here the coarser matters are arrested previous to chemical treatment. Immediately behind the finer screen is a valley 8ft. by 5ft. by 3ft. over which the sewage flows, and into which road detritus and the heavier mineral matters subside. The sewage now flows through a 3ft. by 2ft. blue-brick culvert or carrier for a distance of twenty yards. Here is fixed a Keirby patent mixer for supplying precipitants to the sewage. At the present time this mixer is not working, so that the sewage flows on along the main carrier for another eighty yards, when it enters the sewage ducts from which it can be diverted into any or the whole of the tanks. At the entrance of the duct the alumino-ferric is added, the proportion being regulated by the nature and volume of the sewage, and by the time the sewage enters the tanks the chemical precipitant is thoroughly incorporated with the sewage. All the tanks are arranged on the continuous-flow principle, the sewage entering at the bottom and the effluent falls over a weir at the opposite end.

The precipitated sludge is drawn from the bottom of the tanks by gravitation to a sludge-well, from which it is raised by the Tangye centrifugal pump into the open tank. After standing for a short time the supernatant fluid is run off the surface of the sludge and the latter runs into the rams. From these it is forced by compressed air into the sludge presses. Two per cent. of lime is added during the pumping to assist in the process of pressing. The effluent after leaving the tanks flows along the ducts to five clarifiers, and here all flocculent and fatty matters are arrested so that the clogging of the surface of the filters with an objectionable deposit is obviated. The clarified sewage now flows to the four polarite filters, and here two troughs are provided, one on either side for the equal distribution of the sewage. The filtrate can be passed either on to the land or directly to the river. The night flow, after precipitation, is disposed of on the land filter beds.

Experiments upon the biological purification of sewage have been conducted during the past two years and are still progressing. During these investigations several methods have been introduced, including open septic tanks, contact beds of coarse material, covered septic tanks (not air-tight), and filters constructed of coal, granite, polarite, coke breeze, furnace clinker, and broken potsherds. These experiments are being watched with considerable interest, and it is believed that the results will be satisfactory.

National Health Society.

OFFICIAL TRANSACTIONS.

Lectures in Wales.—One of the Society's lady lecturers has lately been engaged in a short tour in North Wales under the directions of the Girls' Friendly Society. The following places were visited:—Bangor, Llanfairfechan, Penmaenmawr, Llanfair, Llandegai, Menai Bridge, and Holyhead. The lectures throughout were well attended, and much interest was evinced in the subjects dealt with, the associates and other ladies attending the course, as well as the members of the Girls' Friendly Society, expressing their appreciation of the lecturer's teaching.

Oxfordshire.—The teaching on first aid, nursing, &c., is very much appreciated in this county, Miss Christine Hall reporting that at some of the centres she has crowded audiences. Miss Hall is preparing candidates for the Society's examinations, and it is hoped that a large number will present themselves at Oxford when the examination is held.

Examinations.—A week's examination tour is now being held in Lincolnshire by one of the Society's examiners. Miss Morgan, having finished her work in this county for the session, is now undertaking a course of lecturing in Suffolk.

Lectures at Berners-street.—The subject of Dr. Squire's lecture on Tuesday next, March 19th, will be "The Muscular System." Dr. Squire's lectures are given on Tuesdays at 2 p.m. and Fridays at 4 p.m.

Dr. Kenwood's lectures on "Public Health and the Duties of Sanitary Inspectors" are held on Mondays at 4 p.m., and Thursdays at 3.30 p.m.

Mr. E. A. S. Fawcett held an inquiry at Kingswood on Wednesday in last week on behalf of the Local Government Board respecting the proposal of the Urban Council to borrow £27,000 for the purpose of carrying out a sewerage scheme. There was a numerous attendance, including several gentlemen who opposed the proposed site for one of the outfall works comprised in the scheme. The Clerk to the Kingswood Council, replying to the Inspector, said that they had no efficient arrangement for the disposal of the sewage in the district, and certainly they were running some risk to the health of the district through having no proper sewerage system. Their present system was by cesspools. There were two principal brooks into which the sewerage of the district ran, viz., Cheltenham Brook and the brook at Lantern Bottom, and both ran into the Siston Brook, and from thence into the river Avon.

NOTICES.

ANNUAL SUBSCRIPTIONS.—The Annual Subscription to "THE SANITARY RECORD," for the United Kingdom, paid in advance, is 12s. 6d. For the Colonies and Abroad, 15s This includes postage, and a Copy of the Diary, post free.

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AND
Journal of Sanitary and Municipal Engineering.

MARCH 14, 1901.

THE HOUSING QUESTION IN THE LORDS.

THE Marquis of Salisbury was tackled in the House of Lords last Friday respecting the intentions of the Government with regard to the housing of the working classes, and the introduction of the subject led to an interesting debate. It cannot be said, however, to have been very fruitful. The subject arose through the complaint of the Earl of Portsmouth and the Marquis of Northampton—that Lord Salisbury in his speech last December at the conference of Conservative Associations had counselled the Conservative party to increase their hold on the metropolis by making this great question, in which Londoners are so deeply interested, specially their own. It was urged that it was unworthy of the Premier to endeavour to make a party question out of what should be regarded as a national question, without distinction of party. Lord Salisbury's counsel to his followers practically amounted to this—that here was a great social evil, a matter of national concern, growing more serious every day, and that if they were to take it up earnestly, and deal with it successfully, they would reap the gratitude of the electors. Any legislation on the subject must come from either a Conservative or a Liberal Government, and as a Conservative Government is in power, and is likely to remain in power for a good many years, it is fitting that they should consider what policy it is possible to propound. It would certainly be deplorable if the question were made a party question to the extent of dividing political parties upon it, or if the one party should conceive it to be its duty to oppose whatever the other party might propose. But of this we trust there is little fear. We shall welcome a measure of reform from whatever source it may proceed, and provided it is in itself acceptable, we need not concern ourselves with the motives of its authors. It will be sufficient that the public weal is served. Lord Salisbury's speech in December, however, undoubtedly raised certain expectations that the Government were contemplating action of some sort, and he was invited to make a statement of the Government policy. On this subject he had little information to give. He dwelt at length on the immense difficulties with which the whole question is surrounded.

Foremost among these he placed the financial difficulty. No substantial assistance, he opined, could be expected from the London County Council, and as for the Imperial Treasury he held out little hope in that direction. "At present," he went on to say, "we rely to a certain extent on the Local Authorities, who have behaved so well, but we are relying largely, as we have always done, upon private enterprise. That has been our reliance from the first, and when you can find some adequate substitute for it I think that private enterprise must be to the end our main reliance." He admitted that the Government were deeply sensible of the great importance of the question, and deeply anxious to do whatever could be done to remedy the evil, but time and information were essential. He intimated in plain terms that the time of Parliament was already so fully mortgaged for the present session that nothing could be expected this year. For the future he would hold out no promises; but he did throw out a hint that next year the President of the Local Government Board might be in a position to announce some proposals to alleviate matters.

Beyond this, as far as a positive policy is concerned, the Prime Minister was guardedly vague and ambiguous. With these assurances, such as they are, we must for the time remain content.

That the statement contains nothing in the nature of a pledge is a cause for regret, but it is the nearest approach to one we are likely to get. Whatever may be the intention of the Government in dealing with this question, it is quite evident that public opinion in the country will not rest content much longer with the policy of shilly-shally, and unless the Government realise this fact, we are afraid the Premier's sanguine hope of remaining in power for a good many years will be rudely shattered.

The Small-pox Epidemic.

Observations of the progress of deaths from small-pox in London during the thirty years from 1845 to 1874 have established that the seasonal activity of small-pox is greatest in the first six months of the year. April and May are the months most favourable to its spread, but with June comes a turn, and the decline continues during the latter half of the year. The history of the epidemic in Scotland at present gives indications of bearing out this experience. After a period of decline there has come a revival, the renewed activity in Glasgow being very marked. The weekly return of the Medical Officer of Health for the week ending last Friday showed a total of 446 cases under treatment in hospital at the close of the week, as against 385 for the preceding Friday. The issue of the daily bulletins, which had been discontinued for a time owing to the decrease of the epidemic, had been resumed by the Sanitary Department, and further and more vigorous measures have been adopted to endeavour to check and stamp out the disease. The staff of thirty special inspectors, who have been engaged in a house to-house visitation of the infected districts, has been supplemented by twenty additional Inspectors, who are trained vaccinators, and whose chief duty is to go from house to house offering free vaccination to all inmates. When the daily roll of cases began to diminish a few weeks ago, there was at once a falling off in the rush for vaccination, and it is largely to this fact that the subsequent serious recrudescence of the epidemic is attributed. The falling off in the demand for re-vaccination, at a time when an increased seasonal activity of the disease may be looked for, is viewed with concern by the Authorities. Their difficulties have not been lessened by the holding of a meeting of anti-vaccinationists, honoured by a special visit from Councillor Biggs, of Leicester, for the purpose of instructing the citizens of Glasgow in the example of Leicester, and discrediting vaccination as a preventative. Mr. Biggs' mission at so critical a period is certainly an extraordinary one, and though he professes his object to be to strengthen the hands of the Corporation, the answer of the Lord Provost, that he cannot be regarded other than as a hindrance to the work, will meet with hearty approbation. Even had the Corporation no other guide than their experience during the course of the present epidemic, their attitude could not have been otherwise. For a feature of the epidemic is the number of victims over thirty years of age who have not been vaccinated since childhood. Among the patients now being admitted to hospital there is not one who has been recently vaccinated. The neglect of re-vaccination is not, we are sure, due to any disbelief in its efficiency, but rather to a feeling that the danger is passing. That idea must be dispelled. It is satisfactory to know that in Edinburgh, where there are as yet but few cases, the demand for re-vaccination, in consequence of the fear of an invasion of small-pox from Glasgow, has been so great as to tax to the utmost the resources of the Health Department. Sir Henry Littlejohn and his staff have been kept very busy. The daily arrival of a thousand tubes of glycerinated lymph is practically exhausted before noon every day. The poorer classes are taking full advantage of this precautionary measure, and the Authorities are determined, if possible, to keep the enemy outside their gates.

The Arsenic Poisoning Inquiry.

In his evidence before the Royal Commission on Arsenic Poisoning, Dr. Nevin, Medical Officer of Health for Manchester, made a number of practical suggestions as safeguards against the introduction of arsenic into foods or drink. They were as follows :—(1) That manufacturers of food and drinks in the preparation of which chemicals are employed should be required by law to have printed in clear characters on any orders sent to the vendor of such chemicals the words, "To be used in the manufacture of food or drinks," as the case might be. The words foods or drinks to include materials intended for immediate consumption, as well as materials (such as brewers' sugars) to be used in the preparation of foods or drinks. (2) That persons supplying chemicals to be used in the manufacture of foods or drinks should be required by law to affix conspicuously and securely to each consignment of chemicals to be used for such purpose a clear printed statement, in adeqate size of type that the materials supplied are "for the manufacture of foods or drinks." Such a statement should also be required to be printed on invoices of such consignments. (3) That without such statement conspicuously affixed to any consignment of chemicals it should be illegal under a penalty to use chemicals for such consignment for the manufacture of foods or drinks. (4) That as regards malt and hops and other materials used in brewing, it should be illegal for such materials to be contaminated with arsenic. (5) That the Foods and Drugs Acts should be amended so as to ensure that, in case of any deleterious contamination occurring in beer or stout, it may be possible to trace the source of the contamination, and so to ensure the destruction of the deleterious article.

The Peril in South Africa.

From various sources we learn that sanitary affairs are at a very low ebb in South Africa, even in those places untouched by the operations of the war. The Medical Officer of one of the suburbs of Capetown reports an outbreak of typhoid, and "regrets to have to conclude

from the evidence of statistics that the public health of the municipality has deteriorated during the year, owing to a gradually increasing effect of deficient sanitation." Out-of-date systems of night-soil disposal are fruitful in the creation of nuisances. These are set forth by a dweller in Woodstock, who says that "one cause of complaint, and a good and sufficient cause, is the removal of the pails at such an early hour in the evening that to walk in the streets after 9.30 of an evening is to fill one's system with nauseous shudders and to cause the passer-by to wonder if the time is the twentieth century—the age of hygienic and sanitary science—or one hundred years ago. Night after night the filthy vehicles rumble through the streets at the hour when most of the populace are enjoying the none too many beautiful evenings following on a day of toil. The approach of the vans with their fœtid cargoes is the signal for a rush indoors, and tightly-closed doors and windows must remain perforce closed till it is time to retire—the calm, cool wind of heaven poisoned at this early hour." The state of the streets is also a matter of consideration. At certain places are yards, in most cases occupied by tenements crowded with coloured folk, whose ideas of a hygienic life are certainly somewhat elementary. Trickling down from these hidden plague spots comes a filthy stream of thick liquid—it has long ago ceased to be water—gathering in the pools and crevices in the badly-formed gutterings, it lays exposed to the hot rays of a summer sun until the merciful rain perchance falls and washes it down, or the Cape "doctor" covers the festering sores with sand or dust. Time after time does the street scavenger, in cleaning out the storm-water traps, lay the mass of evil-smelling sludge gathered from the base of the trap upon the open roadway, till it dries and is kicked about, only to be gathered again in the course of evolution. If these conditions are not soon altered South Africa will be little better than an open cesspool.

The Dublin Death-rate.

A DEATH-RATE of 49·9 per 1000 is a very serious matter, and happily not often experienced in this country. But such were the figures Sir Charles Cameron had to put before the Dublin Health Committee at its meeting last week. The true meaning of these figures may be realised when compared with London, or the thirty-three great towns of Great Britain. In the former it was 20·9, and the latter 21·5 per 1000. Commenting on this serious position of the Irish metropolis, the *Freeman's Journal* tells us that the character of the districts where the death-rate is highest is particularly instructive. They are the districts where the poor are crowded together in unsanitary habitations. Every investigation that has been made reveals the fact that the unsanitary housing of the poor is the festering evil of the social life of Dublin, fruitful of immorality, disease, and death; yet no strenuous, active, persistent effort seems to be made to tackle that evil and conquer it. Now and again we have a few artisans' dwelling-houses built by the Corporation or by a private company. But the portion of the poor they can accommodate is so small that they are not missed from the vast swarm of suffering and perishing humanity in the more fœtid and unsanitary districts of the city. The public demand impatiently what has been done, and what it is proposed to do, to check this great and growing evil. Constant and efficient inspection was recommended. Have we such inspection? Strenuous, unfaltering rigour on the part of the Corporation in enforcing the sanitary regulations is demanded. Is that rigour universally and impartially displayed? This is not a question for doubt or delay. "While the Corporation wait and argue," continues our contemporary, "the people are dying like flies. The poor are the first sufferers, perhaps the chief sufferers. But they are not the sole sufferers. Disease is no respecter of persons or classes. Issuing from its habitual lurking-place in some squalid slum, it invades the rich and fashionable quarters of the city, where it strikes down its victims, man or woman, young or old, from the old man tottering on the verge of life to the infant just entering on it, with the same inexorable certainty. The rich are scourged for the neglect of the poor by the deaths of many in whom their heart's affections are centred."

No More Cold Rooms.

WE have to travel across the Atlantic to realise what can be really done in the way of communal co-operation, for what appears to be impossible in old countries becomes eminently practical in the new cities of the Western hemisphere. We are only just awakening to the utility of electric traction; but our brethren in America, when they plan a town, the very first thing provided is the electrical railway, and it is made ready for the people before they arrive. But enterprise is going a step further in the city of Churbusco, Indiana. A plan has been devised for heating the buildings with hot water, which is to be supplied just in the same manner as the ordinary domestic supply. Large mains have been laid 3ft. or 4ft. below the ground, and these are protected by many layers of corrugated paper and wood. Specially-constructed boilers have been provided at the central station, and from these hot water is sent forth to all parts of the city. When the housewife desires her rooms to be heated, all she has to do is to turn on the tap, when the water flows through the pipes and radiators in a continuous stream, and in a very short time brings the atmosphere of the room up to the desired temperature. It is said that the system of regulation is so good that the heat can be controlled simply by reducing or increasing the flow of water as the occasion may require. Eventually the water finds its way back to the central station, where it is re-heated. Exhaust steam from ten engines is utilised for heating, and the water is circulated through the streets and buildings by means of a centrifugal pump The experiment is creating considerable interest in the neighbouring towns and villages. If it proves successful, an immense amount of labour will be saved, more

particularly in business houses, and much will be done to keep the city clean and free from smoke, as well as the interior of the houses—two eminently desirable things in all places.

Food Inspection in the City of London.

The Board of Agriculture does not appear to be quite satisfied with the present method of food inspection in the City of London. In a communication just addressed to the Health Department of the Corporation, it is pointed out that last year only 168 samples were analysed, and that the average for the last five years has been under 150 per year. This might be sufficient if the census population represented the condition of the City during the daytime; but when we remember that more than half a million people find their employment within its borders, and that these obtain their food from the stores and shops of the locality in which they are engaged, it will be seen that it is totally inadequate. The Board of Agriculture very properly suggests that a responsible Inspector should be appointed; that from 500 to 600 samples should be taken annually; and that the officer should be encouraged to add to that number in order to test fully the purity of the food and drugs sold within the City. The suggestion is opportune just now, for the City is about to appoint a new analyst. The additional Inspector might be decided upon at once, and both officers enter upon their duties together. We would also recommend that attention should be paid to some of the eating-houses and coffee-shops, which keep springing up in every part of the City. The concoctions dispensed at these places defy the descriptive powers of ordinary individuals, and not a few would be glad to know the result of an analyst's inquiry into their composition. We confess we are among the number.

FORTHCOMING MEETINGS.

March.

Friday 15th.—Sanitary Inspectors' Association. Dinner at Holborn Restaurant. Postponed from February 15th.

Friday 15th.—Sanitary Institute—Lecture to Sanitary Officers at 7 p.m. "Sanitary Appliances," by W. C. Tyndale, M. Inst. C.E.

Saturday 16th.—Inspection and Demonstration at the Sewage and Destructor Works, Ealing, at 2.15 p.m., conducted by Charles Jones, M. Inst. C.E., Engineer and Surveyor to the District Council.

Saturday 16th.—Lecture to School Teachers, Bedford College.

Monday 18th.—The Sanitary Institute—Lecture to Sanitary Officers at 7 p.m. House Drainage, by W. C. Tyndale, M. Inst. C.E.

Tuesday 19th.—The Sanitary Institute—Lecture to Sanitary Officers at 7 p.m. Water Supply, Sources of Supply and Distribution, by Prof. Henry Robinson, M. Inst. C.E.

Tuesday 19th.—Royal Statistical Society: Prize Essay on "The Results of State, Municipal, and Organised Private Action on the Housing of the Working Classes in London and in other large cities in the United Kingdom."

Wednesday 20th.—Inspection and Demonstration in the District of St. George's, Hanover-square, at 2 p.m. (number limited), conducted by Albert Taylor, Chief Sanitary Inspector.

MUNICIPAL ENGINEERING & SURVEYING.

CROSS-TABLE CHAT.

The Municipal and County Engineers' Association having hybernated for nearly six months during the period, when all other professional and scientific associations are most active, has at last left the arms of Morpheus, and resolved to hold another meeting on the 19th inst. at Wimbledon, when our active friend Mr. Cooper, the Surveyor to the Council—than whom few members take a more lively and warm interest in the Association—has provided an interesting programme of visits. I hope to be able to refer to the meeting in the next issue of this journal.

It cannot be said that Mr. Long, the new President of the Local Government Board, is likely to depart from the traditional restraint which has hedged round the hide-bound practice of his predecessors, and we are not likely to witness any revolution in this department, which has earned, rightly or wrongly, considerable notoriety for red-tapeism and tortuous officialdom.

Recently Mr. Long was addressed on the housing question by the Secretary of the National Housing Council, and his reply was in the usual *non possumus* attitude, so dearly beloved by the Board. "In view," he states, "of the emphatic decision on the question of the extension of the period for the repayment of loans, which was arrived at in Parliament so recently as last year, I do not think I can hold out hopes that the matter is ripe for reconsideration by the Local Government Board."

It is a complaint that the building bye-laws of local authorities militate against the erection of cottages at suitable rents owing to the increased cost they indirectly causes, and Mr. Long on this matter writes that, "as regards model bye-laws, I am deeply impressed with the vast importance of throwing no unnecessary impediment in the way of those Local Authorities who are endeavouring to deal with the question of housing of the working classes, and I am therefore at the present time engaged in very careful consideration of the bye-laws of the Board, in order to ascertain whether alteration in any direction appears desirable, and if so, whether such alteration could be made without any unwise relaxation of those standards which are considered essential for the public welfare."

Now this sop to Cerberus will, I fancy, deceive few who are familiar with the subject. Moreover, it is the echo of a complaint which has been raised long ago by landlords. So long, however, as the complaint came from them alone, both Local Authorities and the Local Government refused to heed it. Now, however, when the matter affects Local Authorities themselves financially, a relaxation of the bye-laws is asked for. This Protean attitude of the Authorities is not edifying, and landlords have reason to denounce their waywardness and unjustness. There is, however, I am convinced, little hope that the bye-laws will be materially altered so as to cheapen the cost of houses, and the assistance of the Local Government Board in the matter may be set aside as a negligeable quantity.

One of the ablest articles on this subject is that by Lady Jeune which recently appeared in the *Times*. "The housing of the working classes," Lady Jeune writes, "is a national question, and it is one no longer to be left to municipalities and private individuals, but it is one which should be undertaken by the Government. There appears, however, only one way in which

a Government could deal with the work, and that would be by means of a Commission, constituted like the Charity and Ecclesiastical Commission, with powers to carry out the work on a large scale, and under such supervision it could be done well and honestly." The views of Lady Jeune, in my opinion, deserve the consideration of all persons interested in the engrossing subject, and I advise their careful perusal.

I SUPPOSE that Aldermen and Councillors on our public bodies deem it necessary on public grounds that deputations shall be appointed periodically to visit other towns on matters municipal. The purposes of such deputations are varied, and appear to extend. Whether the results obtained always justify the expenditure is possibly doubtful. But, after all, public representatives are entitled to some "confectionery," and this deputationising is one of the most favourite forms of taking it. It would be interesting to obtain a return of the amount spent by Local Authorities in the kingdom under this head. But I do not attempt to declaim against the practice, for the work of public representatives is rarely recognised or requited, and the educational value of municipal excursions to Councillors is considerable—their views are broadened; their acquaintance with a particular system or systems of municipal work is real, enabling them to arrive at an intelligent decision to the benefit of their constituents, and the methods, customs, and practices of other cities and towns are observed, some of which it is generally found may profitably be adopted. Just as "home-keeping youths have ever homely wits," so have home-keeping Councillors homely, hazy, and crazy ideas of municipal administration.

SUCH a charge could not aptly be made against the members of the Leicester Town Council, who last year sent a tramway deputation to the principal cities in the United Kingdom, and then to Brussels, Hamburg, Berlin, Vienna, Buda Pesth, and Paris—a truly royal trip, and managed on a liberal scale, as may be judged from the bill, which amounted to a sum of upwards of £700. The Leicester Councillors are to be envied. SENEX.

HYGIENE IN THEATRES.

THE question of the hygienic arrangement of theatres, says the Paris correspondent of the *Lancet*, is again to the fore, and at the recent congress on Theatrical Art the Society of Medical Officers to Paris Theatres was represented by a Committee of three. This Committee handed in a number of important resolutions and asked that a medical man should be upon the Superior Committee of the theatres, as, singularly enough, up to now no medical man has been upon that Committee. Certainly a member of the profession in question would be able to afford the Committee valuable advice upon questions of ventilation and the like when plans for the reconstruction or building of a theatre come before it. A medical man could, for instance, in the case of the Comédie Française have ordered the disinfection of the dressing-room of one of the artistes who died from phthisis and whose successor who took over the room also contracted phthisis and died in her turn.

M. Henriot, professor *agrégé* at the Faculty, and a member of the Committee of Hygiene, has undertaken a scientific inquiry into the defects of the Paris theatres from a hygienic point of view, and is taking samples for future analysis of the air from different parts of the house in the hope of discovering the microbes of the disease to which theatre-goers are liable. According to hygienic authorities, theatres are insanitary for many reasons, chiefly because they are badly ventilated and badly lit in so far that they get no sunlight. The ventilating fan is no good, for it raises clouds of dust, and is far worse in this matter than the feather broom. Then there is the floor upon which the audience frequently spits, and which when swept gives off clouds of dust which rise in the air only to fall down again. The most successful theatres, according to M. Henriot, are the most dangerous, for in them the audience stamps with enthusiasm and a quantity of dust is the result. M. Henriot's desiderata would be: (1) Better air and a natural system of ventilation. (2) Large windows through which the rays of the sun could enter. (3) All upholstery instead of being in velvet should be in leather, and no stuff drop scenes should be allowed. (4) All wooden furniture should be varnished, so that it could be washed over with a wet sponge. (5) The floor should be of some impermeable material, so that it could be washed, and should be covered over with a layer of fine gravel which should be swept off every day, and would carry with it all dirt, dust, &c. (*scories*), without the dust floating up into the air.

The Medical Officers of theatres ask for the installation in all theatres, cafés, concerts, and circuses of a *loge médicale*, that is to say, a room kept specially for the purpose, to which can be removed any actor or spectator who may meet with an accident or be suddenly taken ill. The room should be of fair size to enable the patient to be easily attended to, and must be ventilated by a window which opens easily. Its furniture should be only such as is necessary—viz., a sofa, a wash-basin, two or three hand-basins, some receptacle holding two or three litres of some antiseptic solution, and a cupboard for a few necessary drugs and dressings. There should also be a pair of scissors, a knife, a tongue forceps, a Pravaz syringe, and a night commode. The medical men who ask for this installation argue that in the great number of cases of accident cure depends upon immediate treatment by a medical practitioner, who must have the necessary articles for the application of such treatment.

ANNUAL REPORTS.

Hoxne (Essex).—In the annual report on the sanitary condition of the Hoxne rural district for the year ending December 31st, 1900, Dr. S. J. J. Kirby, Medical Officer of Health, calls special attention to the question of water supply, which demands serious consideration, for, being mainly derived from stored rain water, shallow wells, and ponds, it is liable to pollution. From the geological formation and configuration of the district it is found that, except in a few low-lying places, a supply of pure water can only be obtained at a great depth. Dr. Kirby therefore reports as follows:—"In every case in the future where old filters are taken up for the purpose of cleansing or renewal, or where new filters are laid down, I would strongly advocate the use of polarite instead of charcoal. Polarite is rapidly coming to the front as a more efficient filtrant than wood or animal charcoal, and, when once laid, is claimed to be indestructible, whereas charcoal after a time becomes worse than useless, as, instead of removing impurities from the water which passes through it, it gives back the impurities already removed, and it should be frequently renewed. In all cases where the provisions of the Public Health Water Act, 1878, are not complied with, I would earnestly urge upon you the necessity and advisability of enforcing them without delay. The rainfall might be more utilised than it is, and especially where the collecting surface is favourable, as from slate or tiled roofs."

Kingston-on-Thames.—The eighth annual report of the Kingston Medical Officer of Health (Dr. Beale Collins) has been issued. The birth-rate of 26·9 shows

a reduction upon the average for the last ten years, which was 30·3 per 1000; but the death-rate for the year stands at 14·06, which is below the average for the decennial period, namely, 15·1. These figures are based upon a population calculated at 36,604, as to which the Medical Officer remarks "this is little more than a mere guess, the correctness or otherwise of which can only be ascertained after the census." The zymotic death-rate of 1·2 per 1000, as against 2·1 for the last seven years, is a drop that is noteworthy. The only epidemic of the year was one of measles, which raged in the autumn. The Medical Officer puts the number of cases as "probably over 1000." It was "sudden and far-reaching in its onslaught," and he was unable to stay it by means that have proved successful on previous occasions. A few cases occurred in one school in the first week of September, and as no new cases appeared the school was not closed; but suddenly in the second week of October cases occurred simultaneously in three other schools, the disease spreading eventually to all the schools of the town. The Medical Officer's only suggestion for more fully grappling with outbreaks that may become epidemic in the future is "a more intimate supervision of schools and school children by Medical Officers."

Kinross-shire.—The following are the principal points in the annual report of Dr. T. G. Nasmyth, Medical Officer of Health of Kinross-shire. In his opinion the county is well supplied with water, especially at the eastern extremity, where the villages of Scotlandwell, Kinnesswood, and Balgedie are situated. Milnathort is provided with a gravitation supply. There are several farmhouses which are badly off for water. The question of how the hospital proposed to be erected by the county and burgh of Kinross was to be constructed engaged the attention of the Joint Committee on various occasions. The point was whether one of Messrs. Speirs' iron and wood hospitals was to be selected or one of a more permanent nature such as stone or brick. On the grounds of economy, with reasonable efficiency, the Medical Officer advised that an iron hospital would be satisfactory, but the majority preferred stone or brick. Plans have been prepared for the proposed hospital, but these have not yet been finally approved by the Local Government Board. There were fourteen cases of infectious disease notified in 1900, being only one-half that of the previous year. The death-rate (19·6) is the highest in the county for five years, but one-half of those dying were aged people, over 60 years.

Northallerton.—The annual report for the Northallerton district for 1900 shows a general death-rate of 14·72 per 1000, as against 15·26 for 1899; infant mortality 128, against 183; and birth-rate 21·8, against 23·29. The Medical Officer (Dr. Hutchinson) urges the systematic scavenging of the larger villages. Throughout last summer the nuisance and danger to health arising from Romanby Beck were as great as ever they were before Northallerton adopted a chemical system of sewage treatment.

Tottington.—In the course of his report for the year 1900 Dr. Poole (Medical Officer of Health for the Tottington district) says the returns of the local registrar record 126 births—47 males and 79 females—being at the rate of 19·96 per thousand. The deaths registered from all causes numbered 93—40 males and 53 females. Deducting deaths of non-residents and adding those who usually resided in the district but died outside, the deaths numbered 96, the death-rate being 15·20 per thousand. The infantile mortality was 63·50 per thousand births. There were 8 deaths under one year of age, 11 between one year and five, 7 between five and fifteen, 5 between fifteen and twenty-five, 39 between twenty-five and sixty-five, and 26 beyond the age of sixty-five years. The deaths from zymotic diseases were 8, being equal to 1·27 per thousand. During the year 68 cases of infectious diseases have been reported. A systematic inspection of the district has been made during the year, particularly the cowsheds and dairies. Dr. Poole says:—"The dairies are well kept and the farm premises are fairly clean. There have been no cases of zymotic disease traceable to a contaminated water supply. . . The water supply of the district has been more continuous than in previous years and has been of better quality. Water mains have been carried along Harwood-road (Chapel Ward) to houses hitherto unsupplied. . . The house accommodation for the working classes can hardly be considered adequate, but the houses in existence are fit on the whole for habitation, and there is with very few exceptions a sufficient amount of open space about their dwellings. Bye-laws relating to new buildings are in force in the district, but the section relating to the erection of buildings on 'tips' required to be enforced. No building ought to be erected on such tips until the expiry of at least two years." The population of the district in 1891 was 5768; and the population to the middle of the year was estimated at 6312.

Public Works.

SEWERAGE.

The Tarporley Urban District Council has resolved to carry out sewerage works at a cost of £4500.

An inquiry has been held at Hengoed with reference to the borrowing of £11,500 for sewerage works at Bargoed and Terpill.

Mr. Charles J. Lomax, Civil Engineer, of Manchester, has been instructed to report upon the sewerage and sewage disposal of Milford, Derbyshire.

The Blaby Rural District Council has sealed a loan of £2500 for sewerage works at Enderby. Application is to be made for the sanction to a loan for £7500 to carry out the Blaby sewerage, prepared by Mr. J. Turner, the surveyor.

The Tiverton Rural District Council has received a certificate from Messrs. Cameron, architects for the Thorverton sewerage works, for £185, due to Messrs. Hawking and Best, contractors, making the total amount paid to them £828.

It was stated at a recent meeting of the Newcastle-under-Lyme Town Council that, as the result of the recent inquiry concerning the Council's application for sanction to borrow £15,000 for a sewage scheme on the bacteria principle, the Commissioners recommended the extension of the proposed filter beds from 5000 to 6500 superficial yards. The Committee therefore recommended amended plans and estimates raising the cost to £17,225, to provide for the suggested extension. It was decided to apply for increased borrowing powers accordingly.

On the proceedings of the Rivers Committee recently coming up for confirmation before the Manchester County Council, Dr. Dreyfus stated that plans had been submitted for six acres of bacteria beds. When the additional beds were at work, which the Committee hoped would be very soon, they would then be able to purify by the bacteriological process about one-sixth part of the whole sewage of Manchester. The Surveyor had been instructed to prepare plans for an additional twenty-four acres, and when these were finished they would have thirty acres of bacteria beds at work.

The Dumfries Town Council has decided to purchase for £7000 the estate of Castledykes as a site for the proposed sewage works. The scheme of Mr. Allan Carter, C.E., Edinburgh, estimated at £17,500, has been adopted.

Colonel Slacke, R.E., held an inquiry at Rickmansworth last Tuesday to consider the proposal of the Urban District Council to obtain a loan of £31,000 for the purposes of sewage disposal and the construction of sewage and sewerage works.

At a recent meeting of the Lincoln County Council considerable discussion took place at the proposal of the Sanitary Committee to connect the effluent from the Bracebridge Asylum, together with a large volume of surface water from the hillside, with the sewers of the city. It was pointed out by the chairman of the Committee that this would mean that the engines at the Corporation Sewage Works would have to pump an additional 100,000 gallons, raising the total amount to 168,000 gallons daily. On the other hand. the step proposed would place the city water supply from the river source beyond the risk of pollution. Ald. E. Pratt spoke strongly against the proposal to take in the surface water, but Councillor Footman replied that this was the only practicable plan. The suggestion was adopted.

At a meeting of the King's Norton and Northfield Urban District Council, a long report was presented by the Public Works Committee on sewer ventilation. The special Sub-committee appointed to consider the matter had given careful consideration to most of the known systems, and having witnessed experiments and practical trials in the district, had found that most satisfactory results had been obtained by means of a simple water-spray used as an extractor at the base of a tall outlet shaft in conjunction with mica non-return inlets placed on the top of short columns. This system had been devised by the Council's engineer (Mr. A. W. Cross) as the result of experiments commenced at Loughborough, resumed at King's Heath, and lately demonstrated to members of the Sub-committee on a practical scale. This system the Sub-committee believed to be more efficient than any system of shaft or manhole ventilation, and more efficient and economical than any system worked by means of gas burners or water jets. The Committee approved the decision of the Sub-committee, and recommended that application be made to the Local Government Board for sanction to a loan of £3679, namely, £1812 for a scheme of improved sewer ventilation throughout the whole of the Council's sewerage system within the Tame and Rea area, £1130 for improved sewer flushing by means of automatic flushing tanks, and £827 10s. for the reconstruction of defective sewers. The report was adopted.

The Shipley District Council, after four years of anxious labour, was last week able to put into full operation the extensive and important sewage works. There was a large attendance of representatives of various Authorities at the formal opening ceremony, which took place at the works. Mr. Chas. B. Shaw (chairman to the Council), in accepting the gold-inscribed key, stated that the works would cost them altogether something like £75,000. The destructor works had cost them also £4000. He unlocked the door of the pump-house and sets the pumps in motion. The gentlemen present afterwards viewed the various works; the destructor, which was in full working order; the bacteria beds, into which the sewage was flowing freely; and the engine-houses. The destructor, which is of large capacity, and has been in operation for several months, was constructed by Messrs. Meldrum Bros., of Manchester. The furnace consists of a continuous hearth 19ft. long and 5ft. 6in. from back to front. There are four grates, only two of which at present require to be used. One large door will take bulky articles like mattresses. The destructor is at work, of course, day and night, and the two grates in use prove equal to the burning not only of all the Shipley refuse, but of large quantities from the Baildon district as well. The destructor has been specially constructed so as to generate steam freely in the process of burning the rubbish. The heat in the combustion chamber, often equal to a temperature of 2000 deg. Fah., passes into a Lancashire boiler, working at a pressure of 150 lb. After leaving the boiler the gases pass through the regenerator pipes, and enter the ashpits of the destructor at a temperature of 350 deg. Fah. The destructor will burn upwards of two tons of refuse per hour, and will generate steam sufficient for 350 horse-power, 1½ lb. of water being evaporated per lb. of the refuse. The steam raised provides the motive power for the pumping of the sewage, working an engine for breaking up "clinker," and generating electricity for the lighting up of the works. It is fully expected that when the destructor is working at its full capacity sufficient power will be produced to run the two turbine engines that have been put down for providing electric current for sale and for public lighting purposes. The clinker produced is used in the filtering tanks.

WATER.

In the House of Commons the Ilkeston and Heanor Water Board Bill has been read a second time.

The Doncaster Rural District Council intends spending £5000 in improving the water supply of Conisbrough.

The Shifnal Rural District Council has petitioned the House of Commons for leave to oppose the Water Bill, by counsel, when the Committee stage is reached.

A petition praying to be heard by counsel, against the Harrogate Water Bill in Committee stage, has been deposited at the Lords' Private Bill-office, on behalf of Mr. T. G. Lofthouse.

The Kelso District Committee of the Roxburgh County Council has instructed Mr. Harry W. Taylor, A.M.I.C.E., of Newcastle-on-Tyne and Birmingham, to report upon the water supply of Morebattle.

A Local Government Board inquiry has been held at Peasedown St. John with reference to the possibility of providing Peasedown with a proper supply of water. For some time this ecclesiastical district has suffered from lack of water, and notices are posted in the place, signed by the Medical Officer of Health, advising the inhabitants to well boil the water before they use it for drinking purposes. Peasedown is partly in the Clutton union and partly in the Bath union, and this probably has occasioned some delay in dealing with the subject.

At a meeting of the Tees Conservancy Commission, at Stockton, last week, it was reported that the Darlington Corporation proposed to seek power to erect additional pumping engines at Broken Scar, and that they would be capable of abstracting from the river Tees upwards of 2,000,000 gallons of water per day. Alderman J. Samuel said the Tees Valley Water Board was permitted to take 60,000,000 gallons per week out of the river, and when the new reservoir was completed it would have to compensate the river to the extent of 67,284,000 gallons, so that it was really putting into the river 7,000,000 gallons more than it was taking out. It was proposed to supply Hartlepool with some 22,000,000 gallons of surplus water. After further discussion it was agreed that the Secretary obtain particulars of Darlington's proposals, and take such steps as might be thought fit in the interests of the Commission. It was also decided to petition against the Tees Valley Water Board's Bill in order to secure a *locus standi*.

A Local Government inquiry has been held at Natland into an application to borrow £400 for a new water supply.

It is satisfactory to note that the Aberavon Town Council has agreed upon terms for the taking of an auxiliary supply of water from the Margam Urban Council. The coming together of the two Authorities on this matter has given much satisfaction, and complaints as to the dearth of water are now happily at an end.

The Corporation of Bridgnorth, the proprietors of the Staffordshire and Worcestershire Canal, Lord Wrottesley, the Earl of Dartmouth, and Colonel Kenyon-Slaney, M.P., have presented petitions to the House of Lords, notifying their intention of opposing the passage through Committee of the water scheme of the Corporation of Wolverhampton.

A public meeting has approved of the action of the Romford Urban Council in agreeing to lodge a petition to obtain the inclusion of certain concessions in the Bill of the South Essex Water Company. The expense is to be limited to £100, and if more be needed the ratepayers are to be again called together before it is granted. It was stated at the meeting that the Brentwood Urban Council and Billericay and Orsett Rural Councils are holding aloof, although they would benefit by the concessions.

At the meeting of the Spalding Urban District Council last week, it was reported that arrangements had been made with the Clerical, Medical, and General Life Assurance Society for a loan of £30,000, for the payment of the purchase of the Spalding waterworks, recently acquired by the Council, and for carrying out improvements in connection therewith. The loan is repayable in fifty years, the interest charged being at the rate of $3\frac{3}{4}$ per cent., and the half-yearly payment of principal and interest will be £644.

After a good deal of delay, and some additional expense, the Girvan Town Council has decided to proceed with the scheme of forming a second reservoir at Pinmacher, about a mile beyond the present waterworks, with a capacity of storing 15,000,000 gallons. The present reservoir has a capacity of 12,000,000 gallons, and that will give 27,000,000 gallons in all to Girvan. The source of supply is the same as the present, and no better water could be got anywhere. The Council has completed arrangements with the proprietor of the ground, Lieutenant-Colonel Dalrymple Hamilton, through Mr. Inglis, his factor, and Mr. Eaglesham, C.E., Ayr, who so skilfully completed the drainage scheme for Girvan, and also the present waterworks, has been instructed to prepare the necessary working plans for the new reservoir. The work will be proceeded with immediately. The estimated cost of the new reservoir and its connections is about £6000. A new filter has been constructed.

Opposition on the part of Local Authorities to the Barrow Water Bill, which was read a second time in the House of Lords on Friday and referred to a Committee, is deepening. The chief feature of the Bill is to take a water supply from the river Duddon, and to raise the level of Seathwaite Tarn, which flows into the Duddon by means of a dam. The Millom District Council opposes on the ground that the taking away of so much water will injure the tidal way and prevent vessels using the Millom pier. The Hodbarrow Mining Company also oppose, believing their channel and pier will be seriously menaced. The Askam Iron Company have given notice of their intention to appear against the Bill. The Dalton and Ulverston District Councils are asking for certain privileges and reduced water charges; otherwise they, too, will oppose. The Bootle Urban Council has given notice of opposition, while the Commons' Preservation Society ask for the insertion of a clause limiting the amount of land to be taken from Seathwaite Fell in the enlargement of the Tarn, and that a fence be erected close to the water's edge. Certain landowners and commoners are moving for a guarantee of their present rights and privileges.

LIGHTING.

The Omagh Gas Bill has been read a second time in the House of Lords.

The Hereford Gasworks Committee has received the sanction of the Lords of the Treasury to the borrowing of £1500 for the extension of mains.

The Scarborough Gas Company has given notice of their intention of opposing the North-Eastern Railway Bill when it reaches Committee stage in the Lower House.

A Local Government Board inquiry has been held at West Bromwich by Mr. H. P. Boulnois, with reference to the application of the Town Council for sanction to borrow £10,000 for electrical purposes.

The Finance Committee of the Stepney Borough Council has recommended the Council to borrow £122,200 for carrying out the electric lighting of the borough. The Electrical Engineer to the borough estimates that 100 miles of cable will be laid, twenty miles of trenching undertaken, and 280 arc lamps erected.

The Bill promoted by the Corporations of Hartlepool and West Hartlepool for the compulsory purchase of the undertakings of the Hartlepool Gas and Water Company has passed its second reading in the House of Commons. It will therefore now go into the Committee stage, in which the real struggle between the Corporations and the company is expected to take place.

On the recommendation of the Electric Lighting Committee the Southwark Town Council has accepted the tenders of Messrs. Siemens Bros. and Co., amounting to £4310, for the supply and fixing of another 400-kilowatt steam generator, and Messrs. Babcock and Wilcox, amounting to £3230, for the supply and erection of two new water-tube boilers.

A public meeting was held at Pinchbeck, near Spalding, last week, to consider the question of gas lighting of the village. The Spalding Urban District Council, which own the Spalding Gasworks, had been approached with a view to its undertaking the lighting of the village, and a deputation from the Council then attended. The estimated cost of laying the main was put at £665, the distance being two miles, and it was thought that the gas could be supplied to the village at 4s. per 1000 cubic feet, the charge at Spalding 2s. 6d. per 1000 cubic feet net, or if the village would lay their own main, the gas might be supplied at the same rate as at Spalding. A committee was appointed to consider the best method of procedure, and to take a house-to-house canvass to ascertain to what extent the gas would be taken.

It has transpired that as a consequence of the hard state of the money market, and the failure of the Special Committee of the District Council to negotiate a loan for the purchase of the undertaking of the Morecambe Gas and Light Company, the directors have submitted a scheme to the shareholders for the issue of mortgage bonds, bearing 4 per cent. interest, payable half-yearly, amounting to £141,000, the purchase price. Under this scheme the whole of the £141,000, with the exception of £214 1s., will be distributed amongst the shareholders, who will receive the following sums for each £100: 6 per cent. preference stock, £220; ordinary stock, £515; new ordinary stock, £413 13s. 9d. The directors also propose to pay the usual half-year's interest to the shareholders out of the interest received from the District Council during the past six months. The bonds are redeemable at par in five or three years.

The Corporation of Sheffield is prepared to receive applications for an issue of £500,000 Three per Cent. Stock, redeemable at par, on September 30th, 1925. The price of issue is £94 per cent., and interest is payable half-yearly. The present issue is to be applied in paying off loans bearing a higher rate of interest, and in raising funds towards carrying on works authorised by the local Acts and Local Government Board sanctions for extension of tramways, waterworks, electric light and power undertaking, street improvements, extension and erection of hospitals for the purposes of the improvement scheme made under the Housing of the Working Classes Act, 1890, and for the purposes of a recreation ground.

Sir Courtenay Boyle, permanent Secretary to the Board of Trade, presided on Thursday last at the Westminster Town Hall at the second sitting of the inquiry which is being held into the effect of the proposed alteration of the regulations for ensuring a proper and efficient supply of electricity. Mr. Percy Still, chief engineer of the Chelsea Electric Lighting Company, said the company supplied electricity on the three-wire system at both 200 and 100-volt pressure. They generated electricity at 1000 volts, and at sub-stations reduced it to 100 and 200-volt pressure. If the company were to have 100 and 200-volt customers they must have separate plant for each supply, or motor transformers on the consumers' premises. Either would involve very considerable expense. It was more expensive to supply at 100 volts than at 200 volts. The company had 2082 consumers, of whom 1516 were supplied at 200 volts, and 566 at 100 volts pressure; roughly, about 500 had changed from the 100 to 200 volts. Better terms were offered to consumers at 200 volts pressure. At 100 volts the charge per unit was 6d.; at 200 volts the maximum demand system of charge was in force, under which the price after a certain time was reduced from 6d. to 3d. per unit. This meant a reduction in the charge to the consumers of about £3000. The 100-volt consumers were being supplied at a loss, and the company were therefore about to raise their price by 1d. per unit. Mr. S. Baines, electrical engineer to the St. Pancras Borough Council, on behalf of the Westminster company, said the St. Pancras works were the first to supply electricity at the double pressure, or 220 volts. They experienced stubborn resistance to the change from 100 volts in four or five cases, and, as a fact, that had prevented the Authority from economically carrying out the change. They had to duplicate their mains in consequence of these four or five consumers. To induce consumers to consent to the change threats were made that the company would cut off their supply if they did not do so. The inquiry was again adjourned.

GENERAL.

Temporary buildings for cases of small-pox, at an estimated cost of £1200, are to be erected by the Leeds City Council.

As the small-pox epidemic in Glasgow has rather increased than otherwise, the Glasgow Corporation has agreed to establish a special vaccinating corps of 100 men to visit every dwelling in the eastern part of Glasgow and insist upon re-vaccination being performed.

An interesting note has been issued by the Medical Officer of Brighton in anticipation of his report for the past year, drawing attention to the very low mortality from typhoid at Newsholme. He says he has no hesitation in ascribing it to the warning publicly posted on the beach against the eating of oysters, mussels, and cockles from sewage-polluted sources. The sanitation of Brighton has so immensely improved that other causes of typhoid are rapidly disappearing.

The Leeds Town Council contemplates an expenditure of £15,000 in erecting baths and a library in York-road. Baths are also to be provided for the Bramley portion of the city at a cost of £8000.

The Commissioner of Public Health at Brisbane (Dr. Ham) is, we understand, preparing a set of model health bye-laws, which will be subject to alterations, to adopt them to the varying conditions in the different municipalities and divisions. The bye-laws will be based on those of the Local Government Board of England.

The Edmonton Urban District Council having applied for sanction to borrow £30,000 for the erection of a Council Chamber, swimming baths, and other buildings, the Local Government Board wrote saying that the Council had not adopted the Baths and Wash-houses Act. This omission was rectified at the Council's last meeting.

The Newcastle Sanitary Committee is in favour of employing female Sanitary Inspectors. At its last meeting it was decided to recommend the appointment of three—one for each of the three proposed divisions of the city. It was reported that in other large centres of population, such as Birmingham, Manchester, and Liverpool, the employment of women in the above capacity had been a success. The lady Inspectors will, if appointed, be in the Health Department, and under the direction of the Medical Officer.

Last week a special meeting of the Sanitary Committee of the Middlesbrough Corporation was held at the Middlesbrough and Port Clarence ferry. The barge and the wharf were examined, and the other appliances to be used in connection with the barging-out scheme were also inspected. It was decided that a portion of the wharf should be covered with iron plates, and that at high tides the night-soil should be tipped there. It will then be shovelled into the barge. The Committee also decided that the general public, if there was any accommodation, should be allowed to tip rubbish into the barge at a charge of 6d. per load.

Reporting on a case of overcrowding in the Truro district, Mr. E. W. Tonkin, the Sanitary Inspector, stated that at Creegbrawse, near Chacewater, a family consisting of man and wife, three sons, aged respectively 23, 21, and 15, and a daughter aged 18, occupied one bedroom 15ft. by 12ft., and 6ft. 4in. high, giving a total of 1170 cubic feet. The room was partly divided by a screen, and the gross measurement reduced by the space occupied by furniture, and as the minimum air space was 1500 cubic feet, this was a bad case. The father said he could not get a larger house, but there was no reason why the younger members of the family should remain at home.

A well-attended meeting of the Church Sanitary Association was held at the Westminster Palace Hotel last Thursday, when the chair was taken by the Archdeacon of St. Asaph. The Chairman said sanitation was one of the problems of the day. As a rule the clergy were admitted to every house in their parishes, and so might be of very great use in bringing the question to the fore. Dr. Schofield moved the first resolution: "That it is desirable that preachers and teachers inculcate the obligation of endeavouring to secure for all pure air, pure water, abundant light, and wholesome environment." The Rev. Septimus Buss seconded the resolution, which was carried. A second resolution, "That it is desirable that the society organise and develop local centres," was proposed by Dr. Christopher Childs, seconded by the Rev. F. Bailey, and carried unanimously. Mr. Bailey suggested that Leeds should be first approached with regard to courses of lectures on sanitation, and as a likely starting point for a local centre. Lady Jeune moved the third resolution: "That fresh legislation is necessary in the direction of securing the better housing of the working classes." The resolution was carried *nem. con.*, and the proceedings closed.

The Warminster Urban District Council proposes borrowing money for a new technical school, works of sewerage, and water supply.

The Sanitary Committee of Middlesbrough Corporation has decided that provision shall be made in the next estimates for the employment of a woman Sanitary Inspector for the borough.

The Medical Officer to the Gainsborough Rural District Council report last week three adults suffering from diphtheria in one house at Harpswell, where there was a total absence of drainage. Some time ago the Medical Officer advised that a large cellar to a house at Stockwith be filled up on account of its being filled at times with a mixture of sewage and Trent water. There was a case of fever in the house at the time, and he reported a further case of typhoid in the house at present. The Surveyor intends to disconnect the sewer from the people altogether. But this is not sufficient. The District Council must insist on proper drainage being provided, or the place will remain a fever-breeding preserve.

At a recent meeting of the Llanelly Borough Council a petition was presented from the inhabitants of the New Dock district protesting against the Old Coke Works as a site for an infectious diseases hospital on the ground that it was in immediate proximity to inhabited dwellings. The Chairman explained that all that they had done was to instruct their Surveyor to make arrangements with the tenant of the Old Coke Works to vacate the premises at a day's notice, provided that there was an outbreak of infectious disease. Mr. Joseph Williams proposed that the Old Coke Works should not be used as a hospital for infectious disease. Mr. Gwilym Evans moved an amendment that while of opinion that it was not a suitable place, the Old Coke Works should be used in case of emergency. On being put to the meeting seven were for and seven against, and the Chairman gave his casting vote for the amendment.

The Walthamstow Urban Council has erected a model sanatorium for infectious cases with its own workmen, and without seeking any outside assistance whatsoever. The hospital, which was opened on Saturday, stands in five acres of ground at Chingford, and is constructed in blocks, 40ft. apart, so that at any time extensions can be made without disturbing the patients, for whom there are forty-six beds. Although the death-rate in Walthamstow is stated to be as low as in any other district in the metropolis, some 300 cases of diphtheria, and 400 of scarlet fever are met with every year. The need, therefore, for an isolation hospital was urgent, and the fact that the institution was erected by town labour is a testimonial to the enterprise of the local Council.

Mr. W. Price-Heywood delivered a lecture at Clayton last week on the "Slums of Manchester, and the Measures that would tend to their Improvement." He spoke of the necessity for sweeping away the slum areas in the centre of the city, and argued that the owners of insanitary slum property were no more entitled to compensation than the man whose unsound meat or impure foodstuffs were seized and destroyed. As remedial measures for the present evils he advocated the granting to municipal bodies of much greater powers than they at present possess for acquiring land upon which to erect suitable housing accommodation for the poorer classes without the necessity for excessive rentals or the imposition of heavy burdens on local rates. Cheapened train and tram services and the decentralisation of industries were amongst the other topics he touched upon, and Mr. Price-Heywood briefly outlined the scheme for starting in the South of England a "garden city," the factories and workshops of which are to form a huge circle enclosing an area for residential purposes, to be so laid out as to create a "garden city" in the literal sense of the term.

At Whitechapel's great hospital—the London—last year were treated 12,746 in-patients, on whom 9000 operations under anæsthetics were performed. So rapidly is the work growing that great extensions have been made necessary, and to meet all requirements it has been decided to expend the huge sum of £370,000 in the next few years.

A Special Committee of the Glasgow Corporation met on Tuesday to consider the question of municipalising public-houses. It was decided by a majority to recommend that the Corporation should generally approve of the principle, and that application be made to Parliament for powers, the profits to be devoted to public purposes.

Up to the middle of February influenza has this year been almost quiescent—indeed, for several weeks it had almost reached the vanishing point. The changes of atmosphere and of constitution, which accompany the advent of spring, has stirred up a little the latent germs of the malady, which during the past fortnight has made its presence felt insidiously. Last week the deaths directly attributable to it rose to thirty-five, or three times the number recorded three weeks ago. These figures are infinitesimal compared with the fatalities which marked the progress of this scourge in the early months of previous years; but they are sufficiently ominous to warn those who feel influenza coming on to consult their doctor at once and mitigate as far as possible the attack. Otherwise the Registrar-General's returns may be augmented by many victims. The general health of the metropolis remains fairly good, the only disquieting feature, in addition to the influenza, being the prevalence of pulmonary and bronchial complaints, due in the main to neglected colds. The death-rate throughout London was 20·9. Brighton's was 19·2, Croydon's 15·5, and West Ham's 16·9, while Plymouth headed the list with 38·2.

The Local Government Board inquiry into the proposal of the Leeds Corporation, under the Housing of the Working Classes Act, to improve the "Quarry Hill insanitary area," was resumed last week by Mr. R. H. Bicknell, M.I.C.E., at Leeds. The cross-examination of Dr. J. S. Cameron, the Medical Officer of Health, was taken up by Mr. Walter Tempest. He wanted to know something of the people displaced by the scheme in the Quarry Hill district, and what was to become of them. The rents of the houses in the district, Dr. Cameron said, ranged from 1s. 6d. and 2s. to 4s. and 5s. per week. Mr. E. B. Martin, Assistant City Engineer, said he was appointed by the Corporation to take charge, under Mr. Hewson, the City Engineer, of the schemes dealing with insanitary areas. He put in several plans, and went on to give particulars of the property in the area affected by the inquiry. The total population of the area was 10,577, and of that number 9234 belonged to the labouring classes, 254 had no fixed abode and resided in common lodging-houses, and 402 had not houses of their own and rented furnished rooms. Taking a half-mile radius from the outer boundary of the scheme, he found there were 214 empty houses, which, as regards rent, were suitable for occupation by the labouring classes. The vast majority of these houses were in a sanitary condition; at least, they were infinitely better than those in the area. Outside that half-mile and within a radius of a further half-mile there were 300 more houses available, making 514 within a mile radius. He fixed 6s. per week as the maximum rent of a house suitable for the working class. By taking the total area covered by highways (88,559 square yards) in the area, and dividing it by the total length (9853·15 yards) he found the average width of the streets in the area was 26ft. 11½in. The minimum width of streets required in Leeds was 36ft., while the Local Government Board's model bye-laws required a street to be not less than 42ft. in width.

PERSONAL.

Mr. W. T. D. Allen has been appointed District Medical Officer of the Liverpool union.

Dr. Jackson has been reappointed Medical Officer of Health for Carnforth at a salary of £20 per annum.

Mr. John Newby, of Newcastle-on-Tyne, has been appointed Sanitary Inspector for Southwark, out of twenty-six applicants.

Mr. John Barclay, Assistant Sanitary Inspector, Aberdeen, has been appointed Sanitary Inspector for Musselburgh, at a salary of £100.

The Chief Inspector of Factories has appointed Dr. Gordon to be Certifying Surgeon under the Factory Acts for the Towyn district of Merioneth.

Dr. A. Wright has been reappointed Medical Officer of Health for Romford, at a salary of £90 per annum, and Mr. Cornell Sanitary Inspector, at £130 per annum.

Mr. J. E. Parker, C.E., of Blackhill and Newcastle, has been appointed Engineer for the intended scheme of sewerage and sewage disposal for the lower portion of Benfieldside.

The resignation of Dr. J. H. Crocker, who has been appointed Medical Officer of Health for Richmond, Surrey, has been accepted with regret by the Manchester Port Sanitary Authority.

The Health Committee of the Rochdale Corporation has decided to increase the salary of Mr. Lee, Meat Inspector, from £91 to £104 per annum, and that of Mr. Field, Assist. Inspector, from 30s. to 33s. per week.

Dr. T. Orme Dudfield, the Medical Officer of Health for Kensington, who was granted an increase of salary, from £800 to £1000 per annum, on condition that he gave up his appointment as District Medical Officer under the Board of Guardians, has decided to waive his claim for superannuation allowance from the latter body.

His Majesty the King, the Sovereign head and patron of the Grand Priory of the Order of the Hospital of St. John of Jerusalem in England, has graciously accepted the office of patron of its ambulance department, the St. John Ambulance Association, and has been succeeded in the office of President by his Royal Highness the Duke of Cornwall and York, K.G., Grand Prior of the Order.

REVIEWS.

Lockwood's Builder's, Architect's, Contractor's, and Engineer's Price Book for 1901. Edited by Francis T. W. Miller, A.R.I.B.A. London: Crosby Lockwood and Son. Price 4s.

The present edition of the above well-known work of reference may be as strongly recommended to our readers as any of its predecessors. The new edition bears marks of careful revision, and it will be found that the various prices and costs given are well up to date. It appears to us, however, that the portion of the work which is devoted to "Drainage" requires some revision and amplification. The recommendation that ventilation pipes should be "finished at the top with a cone or with one of the numerous extractors," for instance, is hardly in accordance with the practice of advanced sanitarians. Iron drains are now also so frequently used that some reference might be made to them, and their prices given. Prices of manholes, drain bags, and various other matters might also be usefully included in order to render this section as useful and valuable as others in the book.

NOTES AND QUERIES.

Subscribers may obtain advice on matters appertaining to Public Health Law and Municipal and Sanitary Engineering. Letters should be addressed "Notes and Queries," The Sanitary Record, 5, Fetter-lane, London, E.C. If an answer be required immediately, a stamped addressed envelope must be enclosed

2117.—Mortality Rates in Thirty-two Great Provincial Towns for 1900.—"M. O. H." writes:—"I wrote you a short time ago for particulars as to how and where to obtain the mortality rates in the thirty-two great provincial towns in the kingdom, when you were good enough to inform me that such particulars would be supplied by the Registrar-General, Somerset House, W.C. I have pleasure in enclosing you herewith a copy of his reply."

Answer.—We are indebted to our esteemed correspondent for sending us the information. Dr. Tatham, the Statistical Department, Somerset House, writes:—"I am desired by the Registrar-General to inform you that he does publish death-rates for the aggregate of the thirty-two great provincial towns. The estimated populations of these towns in 1900 was 7,021,167, and the births, deaths, and deaths from the principal zymotic diseases summed from the weekly returns amounted to 209,456, 140,280, and 18,872 respectively. These figures are equivalent to annual rates of 29·9, 20·0, and 2·69 per 1000 living.

2118.—New Buildings: Inspection of by Different Inspectors.—"H. W." writes: "Your opinion is asked as regards the procedure of a Sanitary Authority who employs a building Inspector to supervise new buildings during construction and test the drains by the hydraulic test. Although this Inspector certifies the whole of the work, yet if the owner of the property requires a separate certificate for the drainage only, the building Inspector cannot grant it and another official who has not seen the actual construction is sent to test the work. Now I have never known the second official approve what the first official has passed without an alteration of some kind having to be carried out by the owner. My point is, should not the same official certify who has supervision of the work while in progress?"

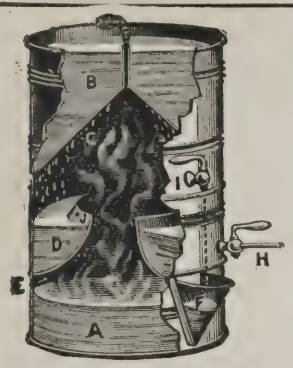
Answer.—We do not feel we should be justified in condemning the system referred to by the querist in the absence of further information. The Local Authority probably have good and sufficient reasons for adhering to it. But our experience of Local Authorities is that aggrieved ratepayers or owners—providing their complaint is reasonable and well-founded—can always secure proper consideration. Moreover, discontented ratepayers have their remedy at the polls, and builders and houseowners usually know how to exercise their influence at such times.

2119.—Sale of Food and Drugs acts: Obtaining Samples of Milk.—"Hygiene" writes:—"I should feel obliged if you will inform me if it is necessary to ask for "new milk" when purchasing samples under the above Acts. Ordinary customers ask for "milk." Consequently, if new milk is asked for, the milk-sellers in the district know it is for analysis, and generally answer in such a way that the sample is not sold, to my prejudice."

Answer.—In Lane *v.* Collins, 14 Q.B.D., 93; 49 J.P., 89; where an Inspector who asked for "milk" was supplied with skimmed milk, which by reason of being skimmed was deficient in butter fat, and proceedings were instituted against the vendor under Sec. 68, the Sale of Food and Drugs Act, 1875, it was held that no offence was committed under this Section. It is, however, submitted that proceedings may be successfully instituted under such circumstances under Sec. 9 of the Act of 1875. Moreover, if the receptacle containing skimmed milk does not contain a label thereon, as required by Sec. 11 of the Sale of Food and Drugs Act, 1899, the vendor will be liable to the penalties provided under this Section. The querist should be aware that it is not compulsory that he should personally obtain the samples. These may be obtained by a deputy and handed to him. See Horder *v.* Scott 5 Q.B.D., 552; 44 J.P., 520; 795; Smith *v.* Stace, 45 J.P., 151. We advise, however, that if "new milk" be required this be asked for.

2120.—Sewage Disposal for Isolated Group of Houses.—"Sanitarian" writes:—"I should be glad if you would give your opinion as to the best practical method of disposal of the sewage from twenty pairs of cottages each side of the road, as sketch herewith. This is outside the Local Authority's district, consequently there is no public sewer. Two said drains will run parallel with the road to a field below. What would you suggest should be done with the sewage after it reaches this point?"

Answer.—The sewage may be treated biologically in tanks and bacteria beds, or by bacteria beds alone, at a comparatively small cost. The querist should obtain Thudichum's "Bacterial Treatment of Sewage," price 1s. 3d.; Martin's "Purification of Sewage by Bacteria," price 6½d.; and Adams' Local Government Board Requirements as to Bacterial Sewage Systems," price 2s. 6d.,



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from which he will be able to obtain information as to the principles of the system referred to. Any of the books named may be obtained post free at the prices named, from the office of this journal.

2121.—INFECTIOUS DISEASE: REMOVAL OF PATIENTS TO HOSPITAL.—"J. M." writes:—"Will you be good enough to inform me what is the meaning of the term 'a convenient distance of such district,' as used in Sec. 124, of the Act of 1875, which refers to infectious hospitals and removal of persons thereto? (2) What is meant by the words 'and is without proper lodging or accommodation,' and who is to decide as to the sufficiency of such lodging. (3) In a district where the nearest hospital is eight miles distant, would the Medical Officer be justified in directing the removal of a patient who is suffering from an infectious disease—say, diphtheria—to such hospital, and when only a very defective ambulance is provided?"

Answer.—It is difficult to give the exact meaning of the term. As to what is a convenient distance, this will depend partly upon the means of access to such a hospital. (2) The term "without proper lodging and accommodation" has been held to apply where a patient, though living with his parents, and was provided with proper nourishment, and medical attendance, could not be isolated in his parents' dwelling-house. See Warwick *v.* Graham, Q.B.D. 15 T.L.R., 410 (1899); 107 L.T., 163 (1899). (3) It is impossible for us to pass judgment on the action of the Medical Officer of Health with the information before us. Only another medical man who had visited the case at the time of removal could be competent to give an opinion. The discretion of the Medical Officer of Health is absolute in such a case.

2122.—INSUFFICIENT WATER-CLOSETS: HAND FLUSHING.—"Sanitas" writes:—"In this town a very large number of cottages are without flushing cisterns and water supply to the w.c.'s In houses where enteric fever has occurred the Local Authority on the report of their Inspector of Nuisances has called upon the owners, under Sec. 36 of the Act of 1875, to provide a proper water supply and flushing apparatus. The water company, which is a private one, have, however, made regulations, approved and confirmed by an arbitrator duly appointed by the Corporation and the water company under seal, one of which states that in tenements not exceeding £20 per annum rateable value every water-closet to which water supplied by the company is laid on, shall have a waste-preventing apparatus of the prescribed kind so constructed as not to be capable of discharging more than two gallons at a flush, and every such water-closet now existing and not having such waste-preventing apparatus, shall either be altered to conform to this regulation, or shall have the water supply cut off from it, and shall be flushed down by hand. Inasmuch as these regulations are all under £20 rateable value, can the Local Authority in face of these regulations enforce the laying on of water and the provision of flushing apparatus under Sec. 36 of the Act of 1875? If not, would bye-laws made under Sec. 23 of the Public Health Acts Amendment Act, 1890, empower the Authority to enforce the same. The arbitration in the above case was made after the passing of the Act of 1875."

Answer.—The regulations referred to by the querist are regulations as to water supply house fittings, &c., issued by the private water company with the approval and consent of the Corporation. Such regulations do not, however, supersede the provisions of the Public Health Acts. The w.c.'s are insufficient for the purposes of Sec. 36 of that Act, being without flushing apparatus, and the Local Authority may by notice served under that section require the provision of a sufficient flushing apparatus. See Sherborne Local Board *v.* Bogle, Q.B.D., 18th March, 1880, 46 J.P., 675. The Local Authority may, by bye-law under Sec. 23 of the Act of 1890, require the provision as regards existing closets of a sufficient quantity of water for the proper flushing thereof, and enforce the provision of cisterns. In such case it is not necessary to prove the insufficiency of the closet.

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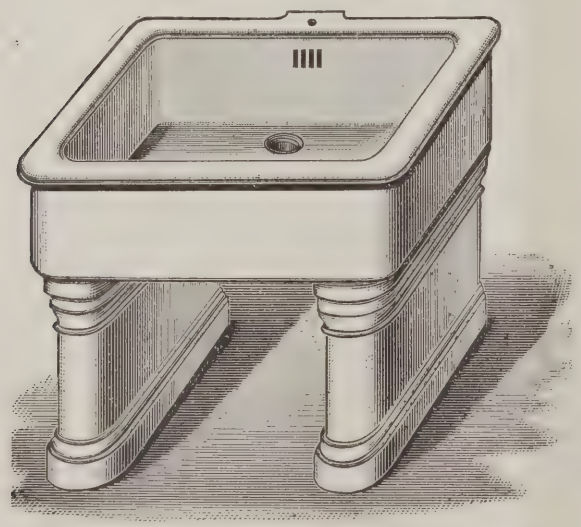

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VENTILATION.—SUCCESS AND FAILURES OF PRESENT METHODS.

A SESSIONAL meeting of the members of the Sanitary Institute was held on Wednesday, the 13th inst., at the Parkes Museum, Margaret-street, W., Mr. J. Osborne Smith, F.R.I.B.A., presiding over a good attendance.

Dr. C. CHILDS, M.A., M.D., opened a discussion on "Ventilation: Success and Failures of the Methods at present in Use." He said that the importance of the question, the complexity and uncertainty of ventilation, and the difficulty of forming opinions, were sufficient reasons for the Institute endeavouring to promote a distinct knowledge with regard to the true nature of the problem and the practical ways of solving it. What was required was the replacing of vague notions with concrete and definite views. Proof of the need for study of the subject could be found in the recent code of regulations issued by the Education Department, which recommended 2½ square inches extraction per head in the upper part of the room, without any definite instruction as to whether the air was to be extracted by the natural process of ventilation, whether by mechanical force, or whether the air was to be exchanged once or ten times in the course of an hour. Much useful information had been obtained by various competent observers, and this information ought to be collected and formulated and treated on a scientific basis. Professor Carnelly had carried out particularly exhaustive inquiries, and advantage ought to be taken of his experiments, particularly in regard to schools. One definite question he desired to raise, viz., whether the plenum system was the best system for schools where the floor space is practically limited to a minimum of 10 square feet per head. The question of the applicability of the plenum system to hospital ventilation also deserved consideration; but this question he thought was at present *sub judice*. Now successful ventilation was that which provides a supply of air (1) sufficient in quantity; (2) of proper quality; (3) of a suitable degree of temperature and humidity; (4) properly distributed in equal proportion to each individual; (5) without producing any discomfort or feeling of draught, or any gradual though imperceptible depression of health; (6) with provision for complete removal of the air which has been exhaled by any individual; (7) in such a way as to maintain fully bodily and mental vigour; and (8) in such a way that the whole process is reasonably practicable and economical. There was also a necessity for considering and arranging the processes of warming and lighting enclosed spaces at the same time with that of ventilation. Frequent failures arose because these three processes were carried out by different individuals without concerted action. The plenum system was that by which air was driven by mechanical means through ducts, shafts, and inlets into and through rooms, and finally out of the building through specially-constructed outlet shafts, the incoming air being warmed in cold weather. The advantages claimed for this system were that the air could be obtained from selected sources; it could be warmed, washed, and filtered; it could be distributed to all parts of the room, and to each individual; the air could be changed ten times in an hour without producing discomfort; a marked improvement could be effected in the alacrity and mental vigour both of scholars and teachers, as compared with the results produced by other systems; and the air contaminated by respiration, exhalations from skin, clothing, &c., was completely driven out of the room. The disadvantages of the system were the dependence of the whole and every part of the system upon individual intelligence, care, and vigilance, and consequent liability occasionally to partial failure or even complete breakdown of the process; and the large initial cost of installation. On the whole the advantages claimed for this system, particularly in the case of schools, had been verified. Dr. Childs then dealt with the so-called natural system of ventilation, viz., the propulsion of air through the agency of atmospheric currents, aided by the warmth of the bodies of inmates, or artificial heat, open fireplaces, stoves, hot-water pipes, &c.; the "exhaust or vacuum system," which extracts air by the agency of heat or mechanical means, such air being replaced by currents through inlets in the outer walls; Dr. Glover Lyon's system for distributing the incoming air in even and regular columns across rooms, the direction and distribution being controlled by mechanical means; and the "open-air system," viz., free perflation through open doors and windows. The conclusions arrived at by Dr. Childs were for the ventilation of school-rooms having less than 16 square feet floor space per head. The plenum system is by far the best, and should be instituted wherever it is practicable; for school-rooms which had a larger area than 16 square feet floor space per head, it might be preferable to arrange for so-called natural ventilation, but he still regarded this as an open question; exhaust systems, and as combined with propulsion systems, are to be condemned; in cases where the plenum system is found to fail, such failure is due to some defect in the installation or manner of working it; for the ventilation of hospitals having a cubic space of 1000 to 2000 square feet per head, the question remains to be decided whether the plenum system is the best, or whether free ventilation by open windows can be contrived without production of draughts or too much lowering of the temperature. With regard to domestic ventilation, for this provision should be made for constant and free ventilation by halls, staircases, and passages, bedrooms should be freely and constantly ventilated by open windows, these being closed only from sunset to bed time; sitting rooms may be freely ventilated during occupation without discomfort by widely-opened windows. For overcrowded places like churches, concert rooms, theatres, and law courts, propulsion, aided by extraction and some modification of the methods advocated by Dr. Glover Lyon, would probably prove most successful.

A long and interesting discussion ensued, the speakers being the Chairman, Dr. Shelley, Dr. Steigman, Mr. Henman, Dr. Glover, Mr. Key, Mr. A. H. Ough, and Mr. McGorman. Votes of thanks to Dr. Childs and Mr. Osborne Smith closed the meeting.

SOCIETY OF ENGINEERS.

NOTES ON CERTAIN DETAILS OF DRAINAGE CONSTRUCTION.

(*Concluded from page* 226).

THE following is the discussion on Mr. Jensen's paper:—

THE CHAIRMAN, in proposing a hearty vote of thanks to Mr. Jensen for his paper, said that the author had given them some very interesting details, which he hoped would lead to a valuable discussion. The remark that perfect details made a perfect whole was more applicable to drainage work than to any other work. Unless every detail of a drainage system was absolutely perfect that system would be utterly at fault. The chain always broke at the weakest link. One point which was always in his mind had not been touched upon, viz., air inlets, which were equally important with air outlets. He did not agree with Mr. Jensen's implication that a good design should cover scampered work; on the contrary, a good design should lead to the prevention of that great evil in all drainage work, scamping.

Mr. W. D. SCOTT-MONCRIEFF said there was a

personal interest attaching to the paper so far as he was concerned, because Mr. Jensen was an old pupil of his. It would be the general opinion that the paper did him great credit, it having the good qualities of being thoughtful, painstaking, and moderate. Mr. Jensen might be taken to have proved his case in each of the points he had raised. The distinctions between most of the diagrams were sufficiently obvious as not to need explanation. He would, however, like to make some remarks on the general bearing of the paper, not upon the experience and daily practice of experts, but upon the interests of the community as a whole. The average layman in this country had been dependent upon the advice and the assistance which had been afforded him by professional men in the matter of domestic sanitation. It would be interesting to have some statistics as to the vast sums of money which, as a matter of fact, had been spent in London during the last twenty-five years in the domestic drainage of that great city. No doubt the expenditure amounted to many millions. Now, the expert—the engineer—and, in the majority of cases, also the contractors, they had a very clear conscience indeed with regard to the way in which the great bulk of that money had been spent. In the early days no doubt some of that money was spent badly and indifferently, and certainly not so well as we with twenty years' experience at the back of us know that it ought to have been spent. Mr. Jensen's remarks were of much interest to the people who had spent these vast sums of money in improving sanitary appliances in their houses, because the more open questions there were in these matters the more expense would they incur. Hence this paper could be looked upon as exceedingly opportune. Looking at the community as the employer of the profession, the most interesting part of the paper dealt with the question of outlet ventilation, but that did not disparage either the importance of inlet ventilation or the minor details which had been discussed. The case of the school quoted by Mr. Jensen was not very creditable to the powers that be, and it was not often that an expert specialist was met with such a *non possumus* as he appeared to have been on that occasion. He thought that there were many districts in London where there was such a number of ventilating pipes terminating about the same level that on a still day there must be created a layer or strata of contaminated air on the plane, roughly speaking, of these vent terminations. This raised a question of great importance; the obvious means of preventing the dangers arising from these conditions is that the drains themselves should be so constructed and the conditions which create these objectionable gases should be minimised, and this could only be done by having the minimum-sized diameter of drain and the maximum available flush of water, unless some oxidising agent is used to prevent the danger. He thought, however, that it was wonderful that so much had been done in the last twenty years in the way of taking drastic measures to force the community to adopt sanitary precautions. He remembered the first case of the adoption of the cardinal principle of disconnection and trapping which was carried out by Dr. Fergus many years ago in Glasgow. The whole sanitary superstructure of the present day had been raised on practically that simple principle. With regard to Dr. Alessi's experiments, he believed that these had been somewhat disparaged, though the reason of this was not at all clear. As those experiments were of great importance he thought they ought either to be confirmed or disproved by repetitions of the experiments by competent bacteriologists.

Dr. Shirley Murphy, Medical Officer of Health to the London County Council, said that the subject was one of almost so entirely an engineering character, that the medical man could hardly be expected to pass an opinion. He had heard Mr. Jensen's paper with interest, because, as was known to some of them, he was interested in certain by-laws of the London County Council which they hoped at no great distance would be in force, and those by-laws imported some of the points which had been touched upon. What had struck him forcibly whilst listening to the paper was the extreme difficulty of getting in drainage work such complete workmanship as would ensure the continuity of a drain. As one of a committee of an infectious diseases hospital, he could say that fifteen years ago the whole drainage of the institution was re-laid under most competent supervision, the drains were laid on concrete and tested, and found perfect when completed. Recently something went wrong, and it was found that now the whole system of drainage was practically faulty, yet the work had been exceedingly well done a few years ago and was then expected to last a lifetime. He would like to elicit some expression of opinion as to the life of good earthenware pipes thoroughly well jointed, and particulars of the life of a drainage system properly constructed. At present there seemed to be much doubt about the matter, and he almost was in despair, and certainly would be if laying good pipes on concrete and properly joined was a failure.

Mr. Silcox thought the Society was to be congratulated upon having had Mr. Jensen's paper. Broadly they could all agree with most of the views he had expressed. The difficulty in these matters was, of course, to get one's clients to undertake the work on the best possible lines because of the cost. The chief points to be kept in mind in regard to ventilation pipes was to have them as large as possible; he would have a large iron pipe with the risk of rust rather than a smaller lead pipe, which he thought was not so effective. He invariably used iron ventilation pipes, enamelled inside, and this got over the difficulty of rust, and if the pipes were carefully handled they would last a long time. As to their actual life he was, of course, not prepared to speak. The rust chambers referred to by Mr. Jensen were easy to make and easy to clean. On the whole he was inclined to favour larger pipes of iron rather than restrict the size to bring down the cost of lead. Most cowls were efficient under certain circumstances, but all sorts were liable to get out of order. He much preferred a perfectly plain wire guard over the top of an open pipe; the passage of air over the top caused a draught nearly as efficient as a patent cowl, and there was less danger of obstruction. Mr. Jensen's suggestion that the bends of ventilating pipes should be enlarged in sectional area appeared to be an excellent one, though he had never adopted it. It was used in connection with steam pipes, especially for heating purposes, and gave good results. Such enlargements might be difficult to get, for he had never seen any made. Air inlets was a difficult subject, and of equal importance to air outlets, because the difficulty was to prevent an air inlet becoming an air outlet. Certain flaps were said to prevent the danger of a sudden down-draught, but as they easily got out of order, they were more or less a failure. They were really brought to this, that the air inlet must be put in such a position that if it did become an air outlet it would not do any harm. This was most difficult to attain, especially in town houses, where the inlet might probably have to be put in a small back yard or front garden, or else carried up by means of pipes along the face of the building; if carried up as high as an air outlet, theoretically it became of equal value to the outlet, and the cost would be excessive. If the pipes were made short. then there was the danger of the inlet becoming an outlet in the neighbourhood of a window. Personally, he preferred to omit them altogether where they could not be provided with safety. With regard to the case mentioned by Dr. Shirley Murphy, it seemed to him there ought to be some explanation which would have been obvious to the person who examined the system. The concrete

might have been laid on a foundation which had sunk, and so caused the pipes to crack, or there might have been exceptional vibration. He had known pipes to break from such a cause, especially when there was a soft or yielding substratum in the neighbourhood of heavy traffic. He had examined many drains, but had never seen good earthenware pipes broken or showing signs of decay unless there was some explanation which was fairly obvious. His opinion of the life of an earthenware pipe was satisfactory.

Mr. Angell (Bermondsey) said that he understood from Dr. Shirley Murphy that there were some local circumstances which had caused the pipes to fail, but he thought it was a question to which they might give their serious attention. The draining of the subsoil would cause a subsidence, and although the pipes might be encased in concrete the pipes would be cracked. With regard to the use of gasket, he admitted that the gasket would perish in course of time and leave a cavity, but would not the sewage be prevented from taking its place by the fact that the spigot was driven right in solid to the socket? This he believed was always an instruction to foremen on drainage works. It was also possible that all the cement would not be removed from the pipes in the way described, leaving the interior of the pipe coated. This would be worse than sewage in the joints, and had been their experience in Bermondsey. In course of time a stoppage was created. He thought there was a tendency in sanitary as in other matters to indulge in a little faddism. Reference had been made to cementing manholes instead of using glazed bricks, but surely if the manhole was built with bricks that are rough on the beds, or, better still, with blue bricks, and built in cement, the manhole would be absolutely water-tight. He did not like cementing manholes; the cement might crack and a considerable amount of obstruction be caused. Local Authorities did not always like to run to the expense of glazed bricks, and private individuals were not always liberal. In the model by-laws issued by the Local Government Board there were several illustrations of air inlets which were useful. He explained the methods he had adopted in certain cases and criticised some of the diagrams illustrating the lecture. The most frequent trap to stop up was the one under the sink. Servants were not supposed to have any education, so the householder must look after these things himself. If therefore servants would stop up these traps, then let them take the traps away and connect them over the head of a gully in the ordinary way. The familiar little copper flap acted far better than any trap could do. With regard to the lavatory basin shown in Fig. 21, this, he thought, was a toy arrangement, and expensive. The simpler an apparatus could be made the better. The proposed water regulations provided for the overflow being carried right through the wall, and this certainly did away with the objection of the pipes choking up, for they would then act in the nature of warning pipes. He thanked the author of the paper for the treat he had given them in putting his thoughts together in the form of a paper. Engineers were often apt to look at matters in a superficial manner, and did not always collect their thoughts as Mr. Jensen had collected his. That was one reason why they should all join in thanking Mr. Jensen for putting the matter before them so clearly.

Mr. Clifford Smith said the paper was a valuable contribution to improvement in sanitation, and he hoped this would not be the last paper Mr. Jensen would write on the subject. He was surprised, however, to find that he had left out the important matter of bath wastes, which were often so much more objectionable than basin wastes. With regard to the remark of the last speaker as to there being a little faddism in sanitary matters, he would join issue on that. He thought if they were still more faddy they would be a great deal more healthy. If there was one thing more than another which is thoroughly neglected in London and the country it is the sanitary well-being of houses. Nobody made a study of it except, perhaps, those who gained their livelihood by it. The consequence was that if anything went wrong, it was generally put down to the fact that the drains were wrong again, or the sink always smells and nobody bothers about it. If it were understood that it is possible to rectify defects and that the drains needed as much attention as a sick person, his opinion was that they would be much healthier. Anyone who had had anything to do with ventilation and drainage pipes must have had the disadvantages of rust brought to his notice. Lead pipes would hardly do where they were subject to rough usage—in a school, for instance, where every boy had to kick the pipe well every day. He found it was advantageous to have glass-enamelled iron pipes; these would do all that was wanted. The suggestion to increase the size of the ventilation pipes at the bend was an excellent idea, but the enlargements would have to taper off, as it would not do to suddenly increase the diameter, as this would create an interruption of the air passage of the whole pipe. The syphonage case of the closet mentioned by the lecturer was a remarkable thing. As to the school, he did not think the trouble there was at an end, and it was to be hoped when Mr. Jensen was called in again his advice would be accepted. There was something radically wrong in that establishment. The indiscriminate distribution of ventilating pipes was altogether wrong. A man who designed a system and distributed his pipes so carelessly would be also likely to fail in the primary object of his whole drainage system. He remembered an instance in which there was an outbreak of tonsilitis very regularly, and at last the cause of the trouble was found to be due to foul air being driven down from the ventilation pipes of drains, the pipes being on the roof of a neighbouring house, and affecting the bedrooms. The occupants of these rooms were always affected. He thought that that instance bore out what Mr. Jensen had referred to. As to the question raised by Dr. Shirley Murphy, he had taken out many earthenware pipes, and in no case had he found the material had degenerated. Where they were broken the fault was entirely due to their being laid on clay. The dry summers we had had would dry up the clay to a considerable depth, the pipes would settle and then crack. Except under these conditions he was of opinion the earthenware pipes would do all that was expected of them, and would be found intact if overhauled at the end of thirty years' time. But country-made pipes, more particularly those laid in soft clay, when brought to the surface at the end of fifteen years or less would break away and crumble, but if exposed to the air for a few weeks would soon harden.

Dr. Farrar complained that there was no precise formula as to the fixing of ventilation pipes. Many he knew were brought out at right angles, rendering them quite negative in results. He ventured to suggest that ventilation pipes should always be passed up straight through the eaves, and the rain pipes brought round in bends, rather than the ventilation pipes diverted, as is often now the case.

Mr. Max Clark said that no one could hear the author's paper without feeling that Mr. Jensen had devoted a very considerable amount of attention to simple details, and he (the speaker) had always found that this really constituted good sanitation. The case mentioned by Dr. Shirley Murphy pointed to the desirability of examination of drains after they had been laid for some years. He did not agree with the writer of the paper on the question of lead ventilation pipes, because when steam or hot water was discharged into the soil-pipes lead ventilation pipes became the worst thing that could be had. With regard to anti-syphonage, the County Council by-laws were quite clear in their regulations as

to where the pipes should be connected with the trap. There was one other thing essential to good drainage, and it was as essential as good workmanship, viz., to keep the fittings and apparatus of all kinds as few and as simple as possible. Each apparatus which could be omitted is so much to the good. One of the gullies in the yard (Figs. 12 and 13), he ventured to suggest, was unnecessary.

A vote of thanks having been heartily accorded to the author, Mr. Jensen rose to return thanks and to reply to the discussion.

Mr. JENSEN said that the President in his criticisms had remarked that drainage work should be so designed that it should not make any allowance for scamping. Perhaps he (Mr. Jensen), in alluding to scamping, had hardly conveyed what he intended. He meant that the design should be in all cases so good that, if scamping did take place and remained undiscovered, the evil results would be minimised. It was far from him to wish to encourage scamping. As for air inlets, he had not mentioned them, as the subject had been already touched upon in a previous paper by Mr. Lawford. The point had been fully discussed on that occasion, and, as there was nothing new to record, any allusion made to the subject would have been in the nature of repetition. Dr. Shirley Murphy had mentioned the case of certain drains which had sunk and cracked, and some discussion had arisen upon the point. Of course, the sinking of drains was not at all unusual, but it almost invariably happened through faulty materials or workmanship, or owing to natural subsidence of the soil. In some cases drains were found to go very soon after they were laid, and in others they would last for a great many years. Upon unsuitable soil the difficulty would not be overcome by laying drains on a concrete bed. He had recently had a case at Wimbledon where the drains had been laid on and surrounded by concrete only some two or three years ago, yet the drains had cracked through the settlement of the ground. Both the concrete and the drains had given way. He thought that the remedy lay rather in the use of iron pipes of great strength laid upon a very broad and thick bed of concrete. Other precautions might suggest themselves when the nature of the ground was known. Mr. Silcox had recommended enamelled iron pipes in place of lead pipes for ventilation. His own experience was that the enamel was liable to crack, and that the pipes rusted behind the enamel and caused it to come off. He should say that such cracking would be very liable to occur where that drainage received steam or hot water, as mentioned by Mr. Max Clark. In such cases one might have pieces of enamel to contend with as well as rust in ventilation pipes. Lead pipes were certainly liable to injury by kicks, &c., but they could be protected by fixing sheet-iron guards round the portion liable to be damaged. Mr. Silcox had said that he preferred to leave drains without any air inlet at all, if he could not place the inlet in a position in which it would be absolutely safe. He presumed that he meant in cases where the drains had more than one outlet, and in which one of the outlets might occasionally act as a ventilating inlet. If there was but one outlet and no inlet, there could be no ventilation whatever, as two openings at the least were necessary for this. As to the alternative of having the air inlet at the same level as the outlet — at the top of the roof — that would in most cases result in stagnation altogether, as the heavier gases would collect at the bottom of the drain and virtually form an air trap. Mr. Angel thought that the evils of an open space at each joint caused by the disappearance of the gasket would not be serious. He (Mr. Jensen) took a more serious view of the matter, more especially in the case of stoneware drains with their numerous joints. The gases generated would alone be a serious objection, to say the least. The edge of the spigot did not always fit closely against the bottom of the socket, as had been stated by Mr. Angel. Very frequently the two were so rough, and touched so badly, that there might be an open space of as much as a quarter of an inch or more between them. Mr. Angel, in referring to the lavatory shown in Fig. 21, thought that many people would object to it on account of its cost. As a matter of fact that particular lavatory was as cheap as the majority on the market. It had been specially made so, he understood, in order to compete with them. Referring to Mr. Clifford Smith's remarks, he (Mr. Jensen) admitted that he had not specially mentioned baths. They were much the same kind of fitting as lavatories, and did not differ from them as regards the treatment of their wastes. What applied to one applied mostly to the other. With regard to the case of syphonage mentioned by him, he thought that this could have been due to no other factor than the two currents of air which were pulling against one another in the soil-pipe. That was the only explanation that he could find at the time after carrying out various experiments. Dr. Farrar had mentioned the case of a ventilation pipe with four right angles and running round the eaves. Of course that was one of the things that should be avoided. Probably the angles would reduce the force of the current to extremely small proportions, and that was one reason why he (Mr. Jensen) had advocated an increase in the sectional area of the ventilation pipe where there was an unavoidable bend. In the particular case instanced by Dr. Farrar the bends could no doubt have been avoided. Mr. Max Clark had desired some particulars regarding slip joints. He (Mr. Jensen) had made a rough sketch of one such joint. A socket was formed on the lower pipe, and the lower end of the pipe immediately over it was pushed into it, and the joint between the two made by a vulcanised india-rubber ring. In that way some room was given for the upper pipe to expand into the socket on the lower pipe.

Mr. MAX CLARK said that he asked the question because it was found that the india-rubber rings deteriorated.

Mr. JENSEN agreed that that was the case, and that the rings required renewal occasionally.

The meeting then terminated with a vote of thanks to the chairman.

CORRESPONDENCE.

(*To the Editor of* THE SANITARY RECORD.)

(*We do not in any way hold ourselves responsible for opinions expressed by our correspondents.*)

"A GOOD RECORD."

SIR,—" Observer's " notes on the township of Batley, I am afraid, are likely to mislead some of your readers. I thought on reading the same that Batley must be a health resort, but when I came to look into the matter more thoroughly, what did I find? Why, that the death-rate of persons dying from infectious diseases for the past five years has been as high in this town as that of the majority of the towns and cities in the West Riding. This is the fairest criterion of the health of a town, not picking a few good examples of freedom from certain ailments, when others more dangerous and more prevalent are passed over. What about typhoid in Batley since 1895!—Yours faithfully,

March 16th. ANOTHER OBSERVER.

A PETITION in opposition to the Prestatyn Urban District Council's Water Bill to secure the existing waterworks, &c., has been filed on behalf of Mrs. Laura Elizabeth McLaren, the wife of Mr. Charles McLaren M.P.

Sanitary Inspectors' Associations.

LONDON.

The Venerable the Archdeacon of London presided over the eighteenth annual dinner of the Sanitary Inspectors' Association held with much success on Friday last at the Holborn Restaurant. Among the company were Alderman Dickinson, J.P., L.C.C., the Master of the Carpenters' Company, the Mayors of Finsbury, St. Pancras, Deptford, Greenwich, and Poplar, Dr. Haward, Dr. F. J. Allan, Dr. Gay, Alderman Redfern, Dr. J. Groves, Rev. C. N. Whitfield, Mr. E. Lewis Thomas, B.A., Mr. A. Richardson, Mr. C. Gordon, Councillor Wilson, Mr. H. Lovegrove, Mr. W. H. Grigg (chairman of the Council), Mr. T. G. Dee (treasurer), Mr. T. Ashdown, Mr. I. Young, Mr. E. Tidman, C.E. (hon. secretary), and over a hundred members of the Association. Pressure of parliamentary duties prevented the attendance of Sir Walter Foster, M.P., Col. S. A. Sadler, M.P., and several other gentlemen, the unavoidable postponement of the gathering on two occasions having led to the absence of many prominent gentlemen who had originally accepted invitations. A capital musical programme was performed under the direction of Mr. T. F. Strutt, the Minnesingers quartet being the principal artistes.

The toast of "The King" was proposed in appropriate terms by the Chairman and enthusiastically drunk, the National Anthem being sung.

The Mayor of St. Pancras proposed "The Houses of Parliament" in a humorous speech, and this was acknowledged by Alderman Redfern of Stockport.

The Mayor of Finsbury submitted the toast of "The Defenders of the Empire," for whom Dr. Groves, Medical Officer of Health for the Isle of Wight, responded, giving his experiences as Medical Officer to a station hospital. He recounted an amusing instance of War-office red-tape, he being consulted by the military authorities as to whether the Local Sanitary Inspector should be allowed to inspect the hospital where typhoid fever had broken out. Of course, he gave his consent, and it was found that the military authorities were pumping water from a polluted well at a cost of 7s. 6d. per 1000 gallons in order to save paying the Borough Corporation a shilling per 1000 gallons for the purest possible water from the chalk.

Dr. Haward, who had been through the Crimean war, also briefly replied to the toast.

Dr. Groves proposed the toast of "Local Government." He said the importance of local government in this country was to be gauged from the fact that it had in its care the chief asset of the State, viz., the health of the community. Local government had to protect the people from what he would call the tyranny of financial interest and the operations of monopolists. Public health was not merely a matter of microbes and preventable disease, but was related to happiness and education. Acts of Parliament were all very well, but they also needed to teach the individual how to preserve his own health and the health of those dependent upon him. The environment of the individual had so much to do with health that the beautifying of our cities was and ought to be a matter of concern to those who regulated our complex civilisation. Those who were connected with local government in this country he believed were doing their level best to bring about a good state of things, and Medical Officers and Sanitary Inspectors were alive to the need for vigilance and zeal. He did not think they would be found wanting, but he referred in strong terms to the uncertain tenure which many Health Officers worked under in the rural districts, and contended that this was a matter which ought to receive parliamentary attention. He was glad to think that in the matter of superannuation and tenure of office the Medical Officers and Sanitary Inspectors were now working heartily together, and justified this on the ground that they had interests in common. (Applause.)

Mr. Ald. Dickinson, J.P., late Chairman of the London County Council, who was loudly cheered, responded to the toast. He said local government was somewhat like a locomotive engine, and depended on three principal factors—the machinery, the guiding hand of the driver, and the motive force. In this country the machinery of local government was a large band of able, honest, and skilled experts, the value of whose services the local governing bodies were only too willing to recognise. He believed that the expert officers were more the personification of local government to the masses of the people than any others connected with local government. Most people knew what an Inspector was, but a councillor or alderman was largely name only. He realised that the expert assistance given to local government had vastly improved to what it was even a few years ago. Now it was laid down that a Medical Officer or Sanitary Inspector should be a man who had made a study of his profession, and very trying and noble was the profession of Sanitary Inspector. The guiding hand of local government was, of course, the governing authority; and here, again, especially in London, there had been a process of great improvement. He recounted some amusing experiences of his own twenty years ago in vestrydom, and said that the old position in which men who ought never to have been entrusted with local government was, he believed, responsible for much of the overcrowding evil of to-day. Had the authorities years ago done their duty when it was comparatively easy to have done it, the serious congestion of population would not now be experienced. There was the third division of local government, the motive force, viz., public interest and concern in their representative bodies. The reason why in the past local government was of a feeble and inefficient kind was because no one took any interest in their election or their administration, so that persons whose interests conflicted with the public interest easily got returned. This had to a certain extent improved, but he believed that the public in this respect had shown far less improvement than either the experts or the governing bodies themselves. For instance, at the recent London borough elections only one-third of the voters went to the polls, and at the last County Council elections only a-half of those entitled to do so recorded their votes. So long as the public showed indifference in this way, so long would it be impossible to get good administration. Good administration depended upon two things, upon the intelligent interest of the public in the proceedings of those bodies, and upon the purifying influence of a continual stream of sunlight being thrown upon the actions of those bodies by the Press. (Applause).

Mr. Alderman Redfern and Mr. Councillor Wilson also responded to the toast.

The Chairman then gave the toast of the evening, "The Sanitary Inspectors' Association," and described in detail the constitution, objects and work of the organisation, which he said had justified its existence by all that it had achieved during the past eighteen years. He regarded such an organisation as theirs as being essential to the improvement and success of the profession. To young Inspectors especially the Association was of great use, for many of them on entering upon their duties found themselves faced with all sorts of difficulties, owing to vested interests, stupidity and prejudice. To such Inspectors it was a great help and encouragement to know that he was backed by an influential body of his colleagues. He warmly recognised the great public work done by Sanitary Inspectors, who regardless of their own safety, fought dirt and disease wherever it was found. He wished it was the duty of

the Inspector to see to the ventilation of churches, for he had to admit, from what he knew in his official capacity, that the proper ventilation of churches was sadly neglected. He was delighted to have had an opportunity of expressing his appreciation of the labours of members of their profession, and urged them to continue their efforts for the public good, despite all drawbacks and discouragements. (Applause.)

The Chairman presented the following awards by the Association at the Health Exhibition held at Lincoln in connection with the Provincial Conference of the Association in 1899, viz.:—Silver medal, Oates and Green, of Halifax, general excellence of manufacture; bronze medal, Guest and Chrimes, general excellence of exhibit; certificates, Wilson and Stockall, ambulance appliances; Charles Duckering, general excellence of exhibit; Arnold and Co., Limited, distilled waters; E. F. Arnold, R.P.C., exhibit of plumbing defects; and Lockerbie and Wilkinson, general excellence.

Mr. W. H. Grigg, Chairman of the Council, responded to the toast, and thanked the Venerable Chairman and Mr. Dickinson for their kindly remarks. He referred to the action taken by the Association on behalf of Sanitary Inspectors generally in regard to libels which had been placed upon them, and pointed out that by the success of the action corporate bodies of professional men had been benefited, for it was now established that honourable professions could not be libelled in general terms with impunity. He also referred to the co-operation of the Medical Officers' organisation and their own in supporting the Bill for superannuation and tenure of office promoted by the British Medical Council, and said the Sanitary Inspectors had been splendidly met by the Medical Officers. He was convinced they would not be deserted, and as a consequence of the agreement arrived at, was about to propose that their own Bill should be abandoned. (Cheers.)

Mr. H. Lovegrove proposed the toast of "The Chairman," and this was drunk with musical honours, the Ven. the Archdeacon of London suitably replying. "The Visitors" was proposed by Mr. W. W. West, and responded to by the Mayor of Deptford; and the toast of "The Press," submitted by Mr. Aubrey Richardson, hon. solicitor to the Association, was acknowledged by Mr. C. E. Ady, of The Sanitary Record.

SANITARY PRACTICE IN REGARD TO LEVELLING HOUSES.

The first of the Freeland course of popular lectures was recently delivered in the Glasgow and West of Scotland Technical College by Mr. Gilbert Thomson, M.A., C.E., who dealt with "Sanitary Practice with Regard to Dwellings: Past, Present, and Future."

The reference to the past was limited to the period of which the lecturer had personal experience—fully twenty years, covering the time during which most of the modern developments had taken place. Illustrations were given of some of the glaring faults in design and construction, and of the curious attempts at improvement that were then frequently encountered, and from these the course of real improvement was traced to its present stage of development. While the past, with regard to sanitary practice, might be fairly described as the time when each one did what was right in his own eyes, the present was, on the contrary, a period of very rigid sanitary supervision, with the result that we now had a very much higher standard of construction, and that a number of general principles were fairly established. We were entitled to congratulate ourselves on that improvement, but we were not to imagine that we had reached perfection. For example, one improvement had gradually been piled on the top of another, and we had, to some extent, incongruous and unnecessary demands made by sanitarians. Not to speak of the excessive ugliness of some of the so-called sanitary work, which made an eyesore to whole neighbourhoods, there was a distinct tendency to elaboration which was not only needlessly costly, but actually less satisfactory than simpler and cheaper methods would be. The various methods of testing by smoke, air pressure, and water were experimentally illustrated, and the opinion expressed that the smoke test ought to be entirely abandoned as a standard on account of its uncertainty. It was most useful for exploring work, but entirely unfit to give proof of soundness. The water test and the air test could give that proof, but while the water was of limited application and involved several practical difficulties, the air test was of easy application, gave a certain result, and met all the requirements of a standard test. The drainage of the new Alexandra Infirmary at Paisley was shown as an illustration of a system that could be at any time, and with ease, tested in this absolute fashion. With regard to the future, the lecturer expressed the hope that those in authority would devote their attention to two points—the enforcement of the highest possible standard of construction, and the removal of every complication that was not absolutely necessary. In that way it might be hoped that the Sanitary Inspector might so improve public opinion and raise the universal practice as to make the compulsory part of his own duties needless.

The lecture was illustrated by lantern slides and experiments.

THE CLEANSING OF CISTERNS.

This important subject is referred to by the Medical Officer of Health for the urban sanitary district of Wimbledon in his annual report. He says:—"The investigation in connection with cases of infectious disease has revealed, in many instances, the improper positions in which the drinking water cisterns are placed. They were found in every conceivable position, often almost inaccessible, and generally uncovered, in coal cellars, water-closets, and under bedroom floors, in the latter cases the ill-fitting boards of the floor forming the cover. This increases the difficulty of the occupier to cleanse the cistern if he should so desire, but unfortunately, this precaution is often neglected. Cisterns have been found to become the last resting place of mice, birds, &c., and these decomposing, cannot possibly benefit the persons using the water. The best remedy for these evil conditions would be for every house to be provided with a draw-off tap direct from the rising main for drinking purposes. This cannot be done, as the water companies supplying the district do not give a constant service. New regulations deposited by them with the Board of Trade for approval, however, require that 'every cistern used in connection with the water supplied by the company shall be made, and at all times maintained water-tight, and be properly covered with a close fitting lid, and placed in such a position that it may be readily inspected and cleansed.' If approved, this regulation should prevent in the future the evil conditions mentioned above."

A Local Government Board inquiry was held last week at Folkestone with reference to the application of the Corporation for powers to construct an electric tramway system within the borough. There is a great divergence of opinion over the matter, the residents in the fashionable quarter contending that tramways will spoil the unique beauty of the town.

MUNICIPAL ENGINEERING & SURVEYING.

CROSS-TABLE CHAT.

THERE was an excellent muster of members at the meeting of the Municipal and County Engineers' Association at Wimbledon on Saturday last; the programme was admirably arranged and carried out; the day was marked by an absence of rain, and when the proceedings were completed the thanks which were accorded to the indefatigable and popular hon. district secretary—Mr. R. J. Thomas—and to the untiring Engineer of the Wimbledon Council—Mr. C. H. Cooper—were as hearty and sincere as they were loudly acclaimed.

THERE was but one opinion held, it was evident, as to the desirability of Local Authorities throughout the kingdom being urged by an official circular from the Association to send their Surveyors to the Engineering Congress to be held in September next in Glasgow, and to pay their expenses. Local Authorities benefit equally as much as, and probably more than, their officials from the latter attending such congresses and exhibitions. Their Surveyor is brought into contact with his professional brethren and his knowledge is kept up to date on the various matters which lie within his province. He attends the reading of papers, takes part in discussions, inspects municipal works in progress from which he gains new ideas, which are subsequently utilised for the benefit of the Local Authorities, and the knowledge gained is diffused, and administration and localities benefitted. The resolution to send out a circular on the subject to each Local Authority in the kingdom was carried unanimously.

MR. COOPER had an interesting record to chronicle of work carried out since the previous meeting of the Association held two years ago in Wimbledon, which he described with his usual modesty, and after he had concluded his description, there was, as is customary and pleasant, a considerable string of questions from members to elucidate information. Some of these questions were, it must be said, of a curious order; for instance, one member wanted to know why in the provision of underground sanitary conveniences more water-closets had been made for females than males, and another member invited the reply which Mr. Cooper wove in with a quaint story as to his reason for providing portable baths in artisans' dwellings.

THE burning topic of the housing of the working classes was of course in evidence, one of the ex-presidents—Mr. Harpur, of Cardiff—emphasising the current opinion that Local Authorities are unable to compete with private speculators in the provision of such dwellings, owing to the restriction of the Local Government Board, that loans for such dwellings should not be granted for a longer period than thirty years. This restriction, which is so absurd, is held to be a striking commentary as to the apathy of the Local Government Board on the subject. If there were any desire on the part of this Government department to assist Local Authorities in grappling with this problem the loan period would be extended, but living up to its reputation as an obstructive, and not an auxiliary department, the nation must suffer until many years have passed wherein the Board may be educated.

I IMAGINE there are few towns of its size which can boast of such an excellent suite of stables and store and stock-rooms as Wimbledon. The exterior elevation of the stables, which are situated in a residential road, is highly ornate, and between the building line and the road the land has been laid out as a small public garden with seats, &c. Surveyors who want to know of an admirable method of book-keeping for stock accounts and of time-keeping may be advised to copy the system initiated by Mr. Cooper, which is an admirable one.

THE infectious hospital constructed from the designs and under the superintendence of Mr. Cooper contains all the most modern appliances and improvements. The idea of conveying steam from the sewage pumping station in iron pipes for some 730 yards to the disinfector is an unusual one, and has been carried out so as to dispense with the necessity for a steam boiler at the hospital.

AFTER luncheon was partaken of at the Baths, Worple-road, brakes were entered for a drive to the Streatham destructor, Ilston-road, Tooting, which was erected by Messrs. Beaman and Deas, for the Streatham Vestry, now incorporated in the borough of Wandsworth. The automatic feeding arrangement introduced by Mr. H. J. Martin, the Surveyor to the late Vestry, and now Surveyor under the Corporation, was explained by Mr. Martin and seen in work. Subsequently the party drove to the combined electricity and refuse destructor works of the borough of Fulham. The scheme has been well developed on broad and progressive lines, but we were unable to ascertain whether the combined system is a success. The destructor, I am bound to notice, was not seen at its best, and improvements are much needed to reduce the excessive amount of dust and fumes in the building. Mention may also be made here of the fact that the combined electricity and destructor works at Wimbledon, constructed from the designs of a consulting electrical engineer, have not, so far, proved successful, and the destructor plant has had to be put out of use.

I UNDERSTAND that the forthcoming summer session of the Municipal Engineers' Association is likely to be an interesting one, owing to the numerous meetings at various places which are in prospect. Amongst other towns to be visited, and already arranged for, are Chichester, Lowestoft, Oswestry, and West Bromwich, whilst the annual meeting will be held at Leicester—a fixture which foreshadows the election of Mr. E. George Mawbey, the Borough Engineer of that town, to the president's chair. SENEX.

BOOK RECEIVED.—"How to Become a Municipal Engineer." J. Freebairn Stow. 1s. net. St. Bride's Press, Limited.

BOILING-POINT OF WATER.—Most persons are apt to regard the point at which water in the domestic saucepan boils as a fixed quantity, unalterable as the laws of the Medes and Persians; but the cooks of a certain town in New Mexico have discovered that, in consequence of its great altitude above the sea, water boils there at 202 deg. Fah. instead of at the normal 212 deg. This means that all the cooking calculations depending upon the heat of the water have to be revised. Everything from a breakfast egg to a silver side of beef takes longer to cook than it does lower down in the atmosphere. Another thing which militates against the calculations of the ordinary cook of the same town is that the air is so dry that vegetables are deprived of half their natural moisture, and must be left a long time in water to recover themselves before being cooked. In connection with this matter of the boiling-point we might observe that if our cooks at home could only realise the fact that it is impossible to heat the water in an open vessel above boiling-point, they would save much of the gas used in so many houses for fuel.—*Chambers' Journal.*

NOTICES.

ANNUAL SUBSCRIPTIONS.—The Annual Subscription to "THE SANITARY RECORD," for the United Kingdom, paid in advance, is 12s. 6d. For the Colonies and Abroad, 15s This includes postage, and a Copy of the Diary, post free.

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The Sanitary Record

AND

Journal of Sanitary and Municipal Engineering.

MARCH 21, 1901.

THE SANITARY NEEDS OF WEST AFRICA.

FEW of us probably have devoted much thought to the question of sanitation in West Africa, for the simple reason that it does not come under our immediate cognisance. But to judge from the statements made by the deputation from the Chambers of Commerce of Manchester, Liverpool, and London, that waited on Mr. Chamberlain last Friday, the question is a very serious one, and in view of the increasing intimacy of our commercial relations with the Gold Coast, it possesses a most important practical interest. Numbers of our young men are sent out there every year as representatives of trading firms at home, but at present it requires no ordinary inducements to persuade them to risk their health in that insalubrious climate. The climate of the Gold Coast has long possessed an unenviable notoriety. It is *par excellence* the "uninhabitable house" of the British Colonies. And we now learn that it is not only the climate—for which nature is responsible—that is to blame for the fearful unhealthiness of the district, but that absence of sanitation—for which the responsibility is human—is in large measure a contributory cause. In Lagos, for instance, the methods of sewage treatment could hardly be more crude or primitive. The sewage is simply turned into the lagoon, to foster and breed disease. The water supply, too, is of the foulest character. The deputation stated that the Liverpool School of Tropical Medicine had done much in connection with the question, but their efforts would not be really effective until the Government took the matter in hand. The points to which they specially directed attention were:—(1) The removal and disposal of refuse; (2) complete surface drainage of the soil, and removal of bush and undergrowth; (3) removal of native huts, where their presence is a menace to the health of Europeans; and (4) the institution of sanitary regulations for observance by the public.

Mr. Chamberlain in his reply was most sympathetic, as, indeed, he always is with all movements calculated to improve the conditions of residence of our sons abroad. To make our West African possessions more habitable for colonists has long claimed his special interest. He was able to assure the deputation not only that the Governors of the Gold Coast had been urged to spare no expense to make West Africa more habitable and healthy, but also that many of the schemes suggested were already in preparation, especially with regard to the disposal of sewage, the residences of Europeans and natives, the water question, and other matters. He accepted the suggestion of the deputation that a Sanitary Commission might be appointed to deal with the whole question, his proposal being that the London, Manchester, and Liverpool Chambers of Commerce should each appoint a member, with, perhaps, someone from the Colonial-office as secretary, and that these representatives of the Chambers should appoint a scientific expert to assist them, whose suggestions they should weigh as men of business. For the ultimate responsibility of deciding what must be done could not be left to any scientific expert. The question of cost must be determined, and they would have to consider the question in that light. The question of how the necessary funds could be provided would have to be referred to the Commission. The Manchester Chamber had expressed itself as willing that a sanitation tax should be imposed, but they suggested that economy rather than taxation should be the means of raising the money required. These would be points that would be left to the determination of the Commissioners. The scheme as outlined by Mr. Chamberlain is eminently businesslike and practical, and we trust to see it ere long in opera-

tion. It should be productive of the very best results.

Plague at the Cape.

The telegraphic reports of the hold that the plague is getting in Cape Town during the last few weeks show that the situation is acute. Originally introduced through the agency of rats, it first established a firm footing in the native quarters, especially in the vicinity of the docks, but it subsequently spread to the European population, and the latest reports indicate that the proportion of European cases is increasing. There have been over a hundred cases, and something like forty deaths have occurred. In consequence of the gravity of the outbreak, the Corporation have entrusted the Government with the full control of the sanitary arrangements of the city. Among the measures that have been adopted are the appointment of a special Plague Advisory Board, including Dr. Gregory, the Government Health Officer; Dr. Fuller, the City Health Officer; and Professor Simpson, the bubonic expert; the systematic cleansing of all houses, for which purpose the city has been divided into districts, each in charge of a doctor, assisted by a sanitary staff, and with the aid of scavengers to destroy the rats; and the removal of the natives from the affected quarters to a special location outside the city, the hovels from which they are removed being either cleansed or destroyed. As usual in such cases, the native population are a source of much trouble. Their dwellings are thoroughly insanitary, and they conceal cases of plague. But they appear to be submitting on the whole to the preventive measures, for wholesale inoculation is proceeding, 2000 having been inoculated in one day. In addition to the Kaffir native population, however, there is a considerable Malay element, who are less tractable, on account, it is said, of their religious views. The removal of one of these people, who was suffering from the disease, was only effected in the face of considerable opposition, but on an attempt being made to remove the "contacts," the Malays assembled in considerable force and drove off the police and municipal officers, and they have resolved in mass meeting to resist eviction to the locations, like the Kaffirs, by force if necessary. The Malay priests, to their credit, are lending their support to the authorities.

The Small-pox Epidemic in Glasgow.

Dr. Chalmers' weekly bulletin last Friday, in connection with the epidemic of small-pox in Glasgow recorded 103 admissions during the week, 122 dismissals, and 23 deaths, leaving 404 cases in hospital, as compared with 446 for the preceding Friday. The total number of cases treated in hospital since the commencement of the outbreak was 1449, with 178 deaths. Too much praise cannot be given to Lord Provost Chisholm and the Sanitary Department for the untiring energy with which they are working. The work of re-vaccination is steadily proceeding so as to embrace as far as possible the whole city. On the invitation of the Lord Provost, a conference of Glasgow doctors was held last week in the City Chambers, under the presidency of the Lord Provost, about 200 doctors being present. The Lord Provost explained that the task they had to undertake was to meet face to face the people who were indifferent to vaccination, who represented the *vis inertiæ*, the strongest power on earth, the most difficult to move. The proposal was to cover the city by direct and personal appeals, and they desired the medical men to assist them. The city had been mapped out into 1100 enumerators' districts in connection with the coming census, and it was proposed to make use of these. He urged that there need be no delicacy on the part of practitioners who went into the service of the Corporation in the discharge of their duty. The object was to have every house visited. With these systematic measures the Authorities expect that the disease will soon be throttled.

A Magnificent Gift.

No other description is expressive of the action made public at the beginning of this week to the effect that the Cadburys have made over to a Trust their model estate at Bournville for the benefit of their workpeople. The terms of the gift are so clear that no misconception can ever arise as to the meaning and intention of the donors, and we cannot but rejoice in the prospect of a multiplication of cottage colonies in which true home-life may be enjoyed by those who dwell in them. It is estimated that the value of the property made over to the Trust is between £170,000 and £180,000. The estate consists of about 416 acres, with 439 cottages erected upon it. Mr. George Cadbury has given to the Trust 330 acres, of which about one-third has been laid out. Upon this portion of the estate 370 cottages have been built, and of these 143 have been sold at cost price on leases for 999 years, 3 per cent. being charged to those who paid less than half of the cost, and $2\frac{1}{2}$ per cent. to those who paid at least half the cost. The remaining 227 cottages and shops are let to weekly tenants, and the rents of these, ground rents, &c., are paid into the Trust. There are about 200 allotments, which are in much demand from the inhabitants of the adjacent manufacturing villages. There are two gardening classes for about thirty youths, each of whom has a small plot to cultivate; these classes are under the care of the Worcestershire County Council. The total rent roll, exclusive of repayment for cottages sold, is £5246 a year, which, after current expenses are paid, is devoted to the development of the estate, and the building of more cottages. The estate is close to two manufacturing villages, and a direct railway line from Birmingham bounds one side. When this estate is completed it is intended, with the income from it, to purchase similar estates, but the intention of the founder is that such estates may be developed as manufacturing centres, one-fifteenth only to be used for manufactories, one-tenth at least to be used for open spaces, and the remainder, as on the Bourn-

ville Estate, to be laid out for cottages and gardens, the buildings not to cover more than one-fourth of the land on which they are erected.

Progress in Italy.

The recent action of the leading authority on public health matters in Italy should have an excellent effect upon the national life of that country. The Higher Council of Health has sent forth a circular to all the subordinate authorities calling attention to the unsatisfactory conditions prevailing in some parts, and proceeds to point out how a change may be made. In the first place, the Council, esteeming that the mortality arising from cases of typhoid fever is relatively high, especially in the smaller communes—a proof that the hygienic conditions are unsatisfactory, and that the supply of drinking water is deficient—urges that the Act empowering the raising of loans for purposes of hygiene should be put into force with all possible despatch in the smaller communes. Then, with a view to the more effective prevention of tuberculosis, the Council urges the promotion of hygienic reform in hospitals by rendering obligatory the isolation of patients suffering from that disease, and the adoption of all precautions necessary to prevent its diffusion. The Council also recommends an inquiry into the state of the prisons, and the utmost extension of sanatoria by enlisting the co-operation of railway companies and great industrial associations. And, finally, the Council urges upon the army and navy authorities the importance of exercising the utmost vigilance in guarding against the admission of recruits suffering from tuberculosis

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Tin-platers and their Work.

An important conference was held last week at Swansea between the Factory Inspectors and tin-plate makers of the district. The object of the meeting was to devise, if possible, better conditions for carrying on this important industry. The basis of the conference was found in certain suggested improvements in the arrangement and ventilating of tin-houses, so as to minimise any poisonous effects to workers from flux, bran-dust, &c., used in the manufacture of tin-plates. The Inspectors present were Messrs. J. A. Redgrave, E. H. Osborne (engineering expert), Dr. T. M. Legge (Medical Expert), Mr. Augustus Lewis, and Miss Rose Squire, whilst the Committee of tin-plate manufacturers was headed by Mr. Trubshaw, president of the Swansea Tin-plate Manufacturers' Association. The conference lasted all the afternoon. A report, it will be remembered, was made on the subject by Dr. Legge last year, in which he suggested that any injurious effects of zinc chloride, flux, and bran-dust, could be overcome by better ventilating arrangements, better draught, and shorter hours of labour at dipping plates, &c. These and kindred suggestions were discussed at length, and although no definite arrangements were come to, it was stated by Mr. Trubshaw that the conference had been valuable in removing a good deal of the friction and difficulties which had existed on the subject between makers and the Government Department. We think that other trades might well follow this example. The "round table" is a wonderful curative of friction and misconceptions of all kinds.

Municipal Engineers at Wimbledon.

On Saturday last the Municipal Engineers made Wimbledon their rendezvous, and a most enjoyable meeting resulted. Perhaps no suburb has made such gigantic strides of recent years as Wimbledon, and the Local Authorities have kept pace with the increasing demands upon them in a way that is eminently praiseworthy. The department of the Surveyor has been especially alive to the responsibilities, and the town is fortunate in possessing in Mr. Cooper an official who is fully capable of carrying out the important work which falls to his share. Few towns enjoy a better equipment, and in many respects the works are a model which might be followed with advantage in many places possessing greater pretensions to importance. The visitors on Saturday appeared to be duly appreciative of this, and inspected the various points of vantage which were open for their special benefit with more than usual interest. In explaining the details Mr. Cooper was indefatigable. The fever isolation hospital and splendidly-equipped offices of the Local Authority elicited praise on all hands, and the visitors left the town feeling that their visit had been something of a revelation. The party was subsequently driven to see the dust destructor at Streatham, and thence to the recently-installed electric lighting plant at Fulham.

PORT SANITARY AUTHORITIES AND THE PLAGUE.

Under the presidency of Dr. Fraser, Hull, a meeting of the Association of Port Sanitary Authorities was held last week in Liverpool.

Dr. M. K. Robinson, Dover, read a paper on "The Recognition of Plague," and said that both at Hull and Glasgow the cases showed that the aid of the bacteriologist was necessary to establish a proper diagnosis and clear up any doubt in the history of the disease. The plague had evidently established a foothold at the Cape, and sanitary authorities should put on their armour and fully equip themselves. That would mean expense, but the Local Government Board should be asked to provide a bacteriological department in connection with the study of this dangerous disease.

Dr. J. Wright Mason, Hull, read a paper on "Recent Experiences of Plague in Hull," describing the measures taken to check the disease, which was there confined to one vessel.

Dr. D. S. Davies, Bristol, discussed the necessity of special care in supervising the discharging of cargoes of vessels from infected or suspected ports.

Dr. Collingridge, London, emphasised the impossibility of diagnosing the plague without bacteriological examination.

Dr. Hope, Liverpool, urged the importance of an early recognition of the plague, and said that in Liverpool they had been fortunate in securing the services of

a gentleman thoroughly cognisant with the conditions associated with plague in India. Port Sanitary Authorities no longer groped in the dark, having now precise knowledge on the most essential points. It was not likely that the plague would develop in this country to a disastrous outbreak, but injury might be done to commerce, as perhaps the South American Republics or the North American Republic might impose a rigid quarantine. Vessels having plague rats on board should be treated as plague-infected ships.

A resolution was adopted that the Association, recognising the great danger associated with the discharge of vessels infested by rats, recommend the Local Government Board to alter the law so as to strengthen the hands of Port Sanitary Authorities in such matters.

INCORPORATED ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

After an interval of several months having lapsed since the last meeting of the Association, the members met at Wimbledon chiefly on the invitation of Mr. C. H. Cooper, the Surveyor to the Council, and through the desire of the popular district secretary Mr. R. J. Thomas, C.E., Aylesbury. Few surveyors work more for the good of the Association than these two gentlemen, and their joint efforts resulted in a large attendance, and in the provision of an interesting programme of visits to municipal works in progress. The members met at the Council Chamber, Wimbledon, where a short meeting was held, presided over by the president, Mr. C. H. Lowe, of Hampstead. An interesting discussion followed on the introduction of a resolution, which was unanimously carried, that local authorities should be asked by circular letter to grant facilities where possible for payment of expenses to their Surveyors to attend the Glasgow Congress of Municipal Engineering, to be held in September.

Mr. Cooper subsequently described the municipal works in progress, and the chief points of interest attached to them, among which were the new road bridge over the London, Brighton, and South Coast Railway, the depôt and stables in Queen's-road, the latter of which has accommodation for thirty-nine horses, the isolation hospital recently constructed, which has accommodation for fifty patients. One of the interesting features in connection with it was that the steam used for disinfectors and numerous other purposes was brought in 3in. pipes from the pumping station at the farm, a distance of 2200ft., thus effecting an economy in dispensing with a boiler and attendant at the hospital. The reduction in pressure of the steam in transit, Mr. Cooper said, was only 5 lb. Plans of proposed new sewage settling tanks—the existing ones having a capacity equal to one-half day dry weather flow—were described, and a septic tank was intended to be also constructed. Plans of additions to electric light station, of a recreation ground, and of artisans' dwellings to let at 7s.6d.per week each, and of flood prevention works, were also described.

A short discussion followed Mr. Cooper's paper, and in reply to questions he stated that the cost of construction of the hospital was at the rate of £400 per bed. The artisans' cottages cost £270 each, and provision was made in them for portable baths. A vote of thanks to Mr. Cooper was heartily accorded. Subsequently the members proceeded to inspect the railway bridge, the depôt, stores, and stables in Queen's-road, and the isolation hospital in Gap-road. Luncheon was partaken of at the baths, Worple-road, after which they drove to the Streatham Destructor, Ilston-road, Tooting, and to the electric light station, Townsmere-road, Fulham.

National Health Society.

OFFICIAL TRANSACTIONS.

Examinations for the Diploma.—The result of the examinations on First Aid and Nursing for those ladies who are studying for the diploma of the Society, have proved most satisfactory, the examiners in both subjects expressing themselves much pleased with the high standard of efficiency attained by the candidates. The following ladies have passed in both the above-named subjects:—Miss Irene W. Cox, Miss Grace Looker, Miss Edith Olliff, Miss Lucy Spiller, Miss Georgina Bevan. These five ladies having previously passed the examination in Sanitation and Hygiene, have now only to satisfy the examiners in one more subject (Physiology) for the completion of the training for the diploma. Mrs. Carol Kelsey has also passed the Nursing and First Aid examinations, while the following ladies were examined and passed only in First Aid:—Mrs. Theodore Fisher, Miss Adeline E. T. Biggs, Miss Madeleine Stampa. Miss Julia Dupins and Miss Edith Gamble have both been successful in passing the examination on Nursing, and Miss Trevor Dickson in satisfying the examiner in this subject has completed her training for the diploma.

Examination for Drawing-room Certificates. — An examination on First Aid for the Society's drawing-room certificate has also been held at Berners-street. The successful candidates are:—The Hon. Dora Webster, Miss Eva Boord, Miss Cecil Buxton, Miss Frances Buxton, Miss Francis Crowle, Miss Hilda Dawson, Miss Dorothy Butt.

Elementary examinations.—We have also to report the result of the examinations in Nursing held in Yorkshire during the last week in February. Forty-one candidates presented themselves, and only six failed to reach the required standard. The examiner speaks well of the work done in each of the five villages visited.

The following summary may be of interest to our readers, as giving some idea of the lecturing and examining work done by the Society during the last three months. From it will be seen that over forty Homely Talks have been given in London to mothers' meetings, clubs, &c., during that time, and nearly 400 candidates have been examined in First Aid, Nursing, Health, &c., in various counties during the same period:—

County Council Work.—Lincolnshire, 7 weeks; Suffolk, 6 weeks; Sussex, 6 weeks; Bangor, 6 weeks; Hove, 6 lectures.

Homely Talks.—East Twickenham, 2 lectures. Chapter House, Mothers' Union, 3 lectures; Fulham, 3 lectures; Finchley, 1 lecture. Sutton, 2 lectures; Notting-hill, 1 lecture; Toynbee Hall, 2 lectures; Putney, 5 lectures; Lyndhurst-road Club, 6 lectures; George-row, 3 lectures; Henley-on-Thames, 1 lecture; Wantage Club, 9 lectures; Shoreditch, 1 lecture.

Berners-street.—First Aid, 6 lectures by J. Cantlie, M.A., M.B., F.R.C.S.; Nursing, 6 lectures by Sister Katharine; Public and Private Hygiene, 14 lectures by John Gay, M.R.C.S., L.R.C.P., D.Ph.; Chemistry, 8 lectures by E. J. Steegmann, M.B., D.Ph.

Schools.—Forest Hill, 6 lectures; Enfield High School, 1 lecture; Southbourne-on-Sea, 6 lectures.

Examinations.—Rye, 24 candidates, Nursing and First Aid; Blaenavon, 7 candidates, Nursing. *Lincolnshire:* W. Torrington, 11 candidates, Nursing; Hatton, 15 candidates Nursing; Alford, 15 candidates, First Aid; Brinkhill 16 candidates, First Aid; Chapel St. Leonards, 13 candidates, First Aid. Sawston (*Cambs*), 19 candidates, First Aid; Sibford Ferris, 22 candidates, First Aid. *Yorks:* Flamborough, 6 candidates, Nursing; Filey, 12 candidates, Nursing; Walkington, 6 candidates, Nursing; Dunnington, 7 candidates, Nursing; Hemingborough, 10 candidates, Nursing and First Aid. *Bedfordshire:* Harrold, 40 candidates, First Aid; Ravensden, 16 candidates, Nursing; Silsoe, 17 candidates, Health; Cranfield, 18 candidates, First Aid; Eggington, 18 candidates, First Aid. *Lincolnshire:* Burton, 22 candidates, First Aid; Conningham, 12 candidates, Health; Brocklesby, 23 candidates, First Aid; East Halton, 8 candidates, Nursing; Market Rasen,

19 candidates, Health. *Diploma:* 11 candidates, First Aid. *Diploma:* 9 candidates, Nursing. *Drawing-room:* 8 candidates, First Aid.

ASSOCIATION OF NATIONAL HEALTH WORKERS.

The monthly "At Home" for members of the Association will be held on Saturday, March 30th. Mrs. Norton has kindly promised to preside.

Public Works.

SEWERAGE.

The Tottenham Urban District Council is about to spend £4000 in works of sewerage.

The Hornsey Urban District Council proposes spending a further sum of £13,600 in works of sewerage and surface-water drainage.

We understand that the tender of Messrs. Bird and Pippard, builders and contractors, Yeovil, for the sewerage works, has been accepted at £14,180.

A Local Government Board inquiry was held at Rickmansworth last week into the application of the Urban District Council for sanction to a loan of £31,000 for sewerage and sewage disposal works.

The Sewerage Committee of the Aberdeen Town Council has accepted the offer of Mr. Roderick M'Kay for the extension of the sewer in Cranford-road at £461, also that of Messrs. Gall and Walker for the extension of the sewer in Walker-place at £26 odd.

Colonel Hepper held an inquiry at Freshwater last week on behalf of the Local Government Board into the application of the Rural District Council for a loan for carrying out Mr. Chatterton's scheme of sewerage, the cost of which is estimated at £24,000 odd.

We understand that the Newtownards Rural District Council has chosen Mr. E. L. Woods, civil engineer, Bangor, to prepare and carry out a scheme of drainage for Donaghadee. Mr. Woods, who is already well known as Town Surveyor of Bangor, was selected for this work out of a long list of competitors from all parts of the kingdom.

Application is to be made by the King's Norton Council for sanction of a loan of £1812 for a scheme of improved sewer ventilation throughout the whole of the Council's sewerage system within the Tame and Rea area, £1130 for improved sewer flushing by means of automatic flushing tanks, and £827 10s. for the reconstruction of defective sewers.

The Northern District Committee of the Ayrshire County Council has resolved to raise no objection to the proposed extension of Kilwinning Burgh. The reasons for wishing the extension are that the lands to be included are feuing lands; that they are already within the special water supply district; that the proprietors are desirous that they should be included; and that the drainage of a dwelling-house built thereon is already being conveyed into the burgh sewers, which is the only practicable means of drainage for that house, as well as for any other which may be erected on the lands proposed to be included.

At a meeting of the Glasgow Sewage Committee held last week, a report was submitted by Mr. A. B. M'Donald, the City Engineer, and Mr. W. Santo Crimp, Consulting Engineer, on the proposed widening of the river at Dalmuir. The report says that the effect of the present modified proposal is to cut off a strip of land belonging to the Corporation, which, in so far as it borders on the south of the intended sewage works, is about 50ft. in width, to which extent the land proposed to be utilised for the precipitation tanks and other arrangements will be curtailed. The reporters consider that it is most undesirable to begin any of the operations included in the contracts for which estimates have been received until the Committee is placed in unimpeded possession of the river frontage. The report was remitted to a sub-committee, to meet and endeavour to arrange matters with the Clyde Trustees.

A Local Government Board inquiry has been held at Tarporley into the application of the Urban District Council for sanction to borrow £4500 for purposes of sewerage and sewage disposal.

Mr. P. Boulnois held an inquiry at Congleton last week, on behalf of the Local Government Board, with reference to the application of the Council to borrow £16,900 for sewage disposal purposes, and £4703 for street improvements. It is proposed to deal with the sewage on the bacteria principle, and eleven acres of land have been provisionally secured. There was no opposition.

At a meeting of the Drighlington Urban District Council last week a communication was read from the Local Government Board in regard to the recent inquiry with respect to the erection of sewage disposal works and for sanction to borrow £12,660 for that purpose. The Board grants the issue of a Provisional Order, but defers for further consideration its sanction for a loan.

At a meeting of the Streets Committee of the Swansea Corporation last week the estimates for the year were produced. The amount totalled £26,997, against £25,577 and £21,747 in the two years last past, and in reply to the Mayor, who said the cost of the streets was being much complained of, the surveyor stated that the amount was not excessive to keep 74 miles of streets in repair. At a meeting of the Water and Sewers Committee it was stated that the amended scheme for sewerage for Brynmill would entail an addition of £13,000 to the cost by laying down a double set of pipes. It is understood the Brynmill outlet and septic tank system was decided on as against the alternative scheme of bringing the pipes up to the pier.

Up to the present time the sewage from the parishes of Winshill and Stapenhill in the Burton borough has been turned into the river Trent untreated. These two places have a population of about 10,300, and the number of inhabited houses is estimated at 2000. There has for some time past been public protest against this mode of sewage disposal, and at its meeting last week the Burton Town Council had under consideration an important report from the Highway and Sewers Committee recommending the adoption of a complete system of sewerage for the two places named, prepared by the Borough Surveyor, Mr. Lynam, and estimated to cost £47,500. The report was adopted with only three dissentients.

Col. Marsh held an inquiry at Haverhill last week into an application of the Urban District Council for sanction to borrow £1100 for works of sewerage. The Surveyor (Mr. J. J. Knewstubb) said that the application was the result of an attempt on the part of the Council to deal with some of the more important part of the sewerage of the town. For several years the immediate district embraced by the scheme had been particularly liable to infectious disease, alleged to arise in the main from defective sewers. Complaints had been continually made about the existing sewers getting blocked, overflowing into the river, flooding cellars, &c., until the Council had been compelled seriously to consider the question. After going very carefully into figures they were satisfied that the best and most economical way of dealing with the matter was to carry out the scheme upon which the present application was based.

Colonel Marsh, Local Government Board Inspector, held an inquiry at Sudbury last Friday with reference to an application of the Town Council for sanction to borrow £20,060 for purposes of sewerage and surface-water drainage —£15,536 19s. 8d. for sewerage and £4523 8s. for drainage. The Borough Engineer (Mr. T. W. A. Hayward) said the present system in the town was more designed for the purpose of carrying out domestic sewers; they were purely old surface-water drains. The number of houses and places in the town where drains would be connected was 1900. The Corporation proposed to connect all the house drains that were at present running into the surface-water drains, and also to connect all houses that were at present unconnected. Dealing with the details of the scheme, the Surveyor estimated that 160,000 gallons per day was the normal dry weather flow, and the basis of the calculation for the capacity of the sewers was six times the dry-weather flow. They were estimating the prospective population at 10,000. The size of all sewers had been decided upon very carefully, and in no case would any sewer run more than one-third full (Weisbach's formula) when carrying off

sewage at the rate of 120 gallons per head per day, thus making provision for when the sewers were running full. The gradients were so arranged that practically every sewer would have a self-cleansing velocity. Provision had been made in the estimates for five automatic flushing chambers, and for fitting up five manholes for use as flushing manholes.

WATER.

Last week the ceremony took place at Cowpe Reservoir, belonging to the Bacup Corporation, of cutting the first sod and laying the first stone of the new reservoir, which will cost £140,000. The sod was cut by Alderman Shepherd, and the first stone laid by the Mayor (Alderman Maden). Mr. James Diggle, of Heywood, is the engineer.

Mr. Goldsworthy, in bringing up the report of the Waterworks Committee at the monthly meeting of Newport County Council, said it was proposed to construct a small service reservoir near Christchurch at a cost of £6000 or £7000, including land, to reduce the water pressure. The outlay would be saved by the economy in the thickness of the main, which otherwise must be of a very strong specification.

At an ordinary meeting of the East and West Ardsley District Council, held last week, it was resolved that the clerk write the Hunslet Rural District Council respecting their complaint regarding the water, that the matter has been considered, and their communications have been forwarded to the parties from whom the water is obtained, and that the Council have also had an analysis taken, which does not agree with the assertions made by their Medical Officer.

For some time past the Water Committee of Crieff Town Council has had under consideration the improvement of and additional storage for the water supply of the town. At the end of last year Mr. Robert Gilmour, C.E., Glasgow, was instructed to examine and report on the whole system, and at the last monthly meeting of the Council his report was submitted, in which it was shown that the present reservoir on the Knock was too small. He, therefore, proposed the laying down of additional piping between Loch Turret and Crieff, the erection of filters and a new reservoir on Ochtertyre estate, capable of containing 2½ million gallons of water, equal to a five-days' supply for a population of 10,000. The recommendations of the engineer were approved, and the works will be proceeded with immediately.

On the second reading in the House of Commons last week of the Wolverhampton Corporation Water Bill, Mr. A. H. Brown rose for the purpose of moving its rejection. He contended that public rights must ordinarily take precedence over private rights. The case of Wolverhampton differed from that of many other towns, in that they had already, by legislation, ample means of getting water if they wanted it, and there was no necessity for the Corporation to come to Parliament for further powers. The opponents of this Bill contended that large interests would be seriously damaged by putting down the necessary works. The interest of landowners and proprietors of public works would be interfered with. If the necessary wells were put down, all the money expended by other authorities in obtaining a supply would be practically wasted, and the taxpayers would be saddled with a heavy burden.

A meeting of the Water Committee of the Arbroath Police Commission was held last week. The Clerk (Mr. W. F. Mackintosh) read a lengthy report by Mr. M'Culloch, C.E., regarding financial matters connected with the Nolt Loan extension scheme. The statement showed that the total claim of Messrs. Patterson, Limited, Glasgow, the contractors for the work, amounted to £12,518 7s. 11d. The Commissioners' engineer, however, valued the work done at £5169 1s. 6d., of which sum the Commissioners had paid to account £5000, leaving a balance due to the contractors of £169 1s. 6d. If, however, it were the case that the work had not been carried out according to contract and in the specified time, the engineer brought out that, in place of the Commissioners being due the contractors the sum of £169 1s. 6d., the latter are actually due the Commissioners a total of £3570 19s. 3d.

A Local Government Board inquiry has been held at Shifnal with reference to an application by the Town Council of the Borough of Wenlock for sanction to supply water to the rural district of Shifnal for the benefit of the contributory places of Badger, Beckbury, Kemberton, Shifnal Special Drainage District, Shifnal, Stirchley, Stockton, and Sutton Maddock.

Last Thursday the Waterworks Committee of the Manchester Corporation had under consideration matters relating to the laying of a second pipe from Thirlmere to Manchester. The first contract for pipes has been let, and the second and third are now being dealt with. Tenders for the fourth and last lot required remain to be invited. When this has been done the tenders for laying the pipes will be considered. It is expected that the work will be commenced in the early summer. The section lying between Prestwich and Hoghton Tower, near Preston, is the first to be undertaken. The Committee intends to offer a strenuous opposition to the Bill which the Salford Corporation is promoting in the present session of Parliament with the object of getting the supply of water to its borough on more favourable terms.

At the last monthly meeting of the Edinburgh and District Water Trustees the engineer was authorised to present Sir John Murray, K.C.B., with a copy of the lithographed sheets of plan and cross-section of St. Mary's Loch in connection with the investigations being carried on by him for scientific purposes regarding the depth and areas of Scottish lochs. A letter was submitted from the town clerk of Musselburgh in regard to the supply of water to Musselburgh and Inveresk, enclosing a report by Messrs. Belfrage and Carfrae, C.E., as to the existing and proposed improvement of the supply, and requesting a conference with the trustees on the subject. The report stated that by agreement with the Trust it was provided that Musselburgh and the Inveresk Local Authority should have a preferential supply of 360,000 gallons per day to be delivered in bulk to Musselburgh and the special water district of Inveresk before Portobello or other places near to or on the line of main pipe between Cameron Toll and New Craighall were supplied. The report was sent to the engineer.

At the last monthly meeting of the Largs Town Council a report was submitted from Mr. W. R. Copland, C.E., Glasgow, on the matter of extending the present reservoir at Middleton. Mr. Copland reported that to extend the reservoir as far north as possible would give additional storage for 1,330,000 gallons, at a probable cost of £1010, equal to £750 per million gallons; to extend it and raise it 3ft., would give 6,300,000 more gallons, at a probable cost of £4400, or £698 per million gallons; while to raise it 5ft. would give 16,000,000 gallons, at a probable cost of £6800, or £425 per million. These prices did not include the cost of land, and the cost was on the assumption that the puddling of the present embankment would be sufficient for the increased height. If this was not so the cost would be materially increased to probably £8000. On the other hand, the proposed new reservoir on the Noddle was proposed to provide 44,000,000 gallons extra storage at a cost of £8000, or £182 per million gallons. The matter was left over till next month to allow the councillors to consider the report.

LIGHTING.

The Long Eaton Gas Bill has passed the first reading in the House of Commons.

It is stated that the Bradford Corporation is making another effort to acquire the undertaking of the Clayton Gas Company.

The Local Government Board has sanctioned the application of the Burslem Town Council to a loan of £31,000 for the purposes of the gas undertaking.

Delegates from twenty-six different Scottish burghs met in the Religious Institution Rooms, Glasgow, last Friday, for the purpose of considering the Bills that are being promoted by the Clyde Valley Electrical Power Company and the Caledonian Power Company. The principal business of the meeting was to make arrangements for opposing in Parliament the Bills referred to, in the interests of the different burghs.

A PETITION on behalf of the Nottingham School Board, praying to be heard by counsel against the Corporation Gas Bill, when the Committee stage is reached, has been deposited in the Private Bill-office of the House of Lords.

AN official notification has been given that the Bill promoted by the Newcastle-upon-Tyne and Gateshead Gas Company will pass as an unopposed measure through the House of Lords, no petitions having been presented against it within the time allowed by the Standing Orders.

THE Abingdon Gas Company has made a trade profit of £1900 on the year, and the dividends for the year are £6 10s. and £4 11s. on the two classes of shares. The quantity of gas sold was nineteen millions, an increase of one million and a-half cubic feet. The installation of new regenerative furnaces obviated the necessity of raising the price of gas in consequence of the increased cost of coal.

A BOARD of Trade inquiry was held at Caterham last week into the application of the Caterham and District Gas Light and Coke Company for powers to extend their area so as to include the parish of Woldingham, and for the erection of two gasholders in the chalkpit situate at the rear of the Public Hall, Godstone-road, Caterham Valley. Considerable opposition came from the residents in the vicinity.

THE annual report and statement of accounts of the Leamington Priors Gas Company has just been issued. The directors recommend that the usual dividend of 10 per cent. on the A shares, and 7 per cent. on the B shares, less income tax, be paid. A majority of the shareholders have expressed themselves desirous of allowing the Leamington Corporation to withdraw from the purchase of the gasworks, and the matter is now having the serious consideration of the Board.

A NEW system of electric lighting is being tried experimentally in several carriages of the London and South-Western Railway, and should it prove successful the scheme will be generally adopted. Each compartment is to be fitted with four lamps, whilst one switch (which will be under the control of the guard) will serve a whole carriage of about eight compartments. The lamps are placed in convenient positions, so that passengers occupying corner seats will be enabled to read with the same degree of comfort as others in the compartment.

THE Mayor, Captain Gerald Walker, presided at a general meeting of the Richmond Town Council last week, when a lengthy report was read from Mr. John Wright, manager of the gasworks, giving the result of a general inspection of the gas mains throughout the town. The investigation showed leakages estimated to lose 1,224,340 cubic feet per annum. The cause of the leakage was attributed largely to defective mains and services. The leading mains had been laid thirty years, and over £3000 had been expended. He recommended all old and small mains and services should be replaced by larger ones. The meeting adjourned for a fortnight.

AT the Westminster Town Hall, on Thursday last, the inquiry by the Board of Trade to consider the application of various electric lighting companies and Local Authorities for an alteration of the regulations for ensuring a proper and sufficient supply of energy was resumed. At the sitting on Tuesday the following new proviso was put forward as a basis on which the parties might agree:—"Provided that no change shall be made in the pressure of the supply to any premises which on . . . . were supplied with energy by the undertakers except with the consent of the consumer; but, where the consumer withholds his consent after the undertakers have offered to pay the reasonable costs of or incidental to the change, the undertakers may appeal to the Board of Trade, and that Board may, if they think fit, dispense with the consent of the consumer on such conditions as the Board impose." Mr. Gunyon, in charge of the Electric Lighting Department of the London County Council, said that in his opinion the proposed change would not confer any benefit on the consumers; in many cases they would be the losers. If the pressure were put up to 200 volts the susceptibility to fire would become greater. If more pains were taken in the fittings and in the installation generally the risks were not so great. The proposed change would mean increased cost of all lamps, shorter life, less efficiency, and increased danger of fire.

THE Gas Light and Coke Company's Bill came up for second reading in the House of Commons last Thursday night. The brief discussion which took place showed, however, that there was not the slightest chance of its success, and to avoid a formal rejection it was withdrawn.

MR. HAWTAYNE, the Lowestoft Corporation's consulting electrical engineer, has presented the Council with a scheme for extending the light to all parts of the town, which the Corporation has affirmed. The scheme includes the providing and connecting of 526 new posts, of which 200 would be fitted with 32 candle-power lamps, and 386 with 16 candle-power lamps—say, six switching points complete with all accessories, £9550. All necessary road work is provided for in the estimate. The annual cost of lighting under the scheme, including interest and sinking fund at the rate of 5¼ per cent. on the capital outlay, is £1836 17s., or £2 14s. 6d. per annum each 16 candle-power lamp, and £3 18s. 6d. per annum for each 32 candle-power.

GENERAL.

THE Stockport Corporation is acquiring for £14,000 a site for the erection of municipal offices.

THE Brentwood Urban Council's scheme for the erection of from thirty-four to thirty-six cottages, under the provisions of the Housing of the Working Classes Act, at an estimated cost of between £6000 and £7000, has been cordially approved by the ratepayers of Brentwood in public meeting.

DR. GEORGE REID, Medical Officer of Health for Staffordshire, gave evidence last week before the Royal Commission on arsenical poison in beer. As to preventive measures, his suggestions included one that the Inland Revenue Department should be called upon to exercise control over the quality of brewing materials from a health point of view, by its being made part of the duty of Excise officers to see that a guarantee of the sugar used is obtained, and to periodically collect samples of materials for analysis by Somerset House.

LAST Friday afternoon two additional blocks at the Crossley fever hospital, belonging to the Mirfield and Liversedge District Councils, were formally opened for the reception of typhoid fever patients. Originally the hospital was confined to the treatment of cases of scarlet fever, but the prevalence of typhoid at Liversedge some time ago resulted in the two new blocks being attached to the present structure. The building, although only a temporary structure, is most comfortably furnished and fitted up with the latest appliances, the cost amounting to £1600.

AT a recent meeting of the governors of the Dundee Royal Infirmary the chairman referred to the treatment of consumptive patients in the shelters recently erected in the infirmary grounds. He said a number of patients had been treated under the new system. It was found that they markedly improved, and a considerable portion of them were able afterwards to undertake light employment. An excellent moral effect was produced, as the patient gained encouragement and came to know that his health lay largely in his own hands, and endeavoured when he returned to his home to carry out the principles he had learned, namely, the importance of fresh air, sunlight, and nourishing food.

A GREAT advance in the sanitation of West Hartlepool is expected to date from the time when the new refuse destructor gets fairly and fully to work. Hitherto the refuse has had to be carted out of the town, a process which has been found both tedious and costly. With the destructor at work more expeditious and effective treatment is anticipated. The destructor is one of the Horsfall Furnace Syndicate's, with patent furnace, and has been constructed under the superintendence of Mr. J. W. Brown, the Borough Engineer. It consists of six cells, each capable of burning 12½ tons of night-soil refuse in twenty-four hours, or a total of 75 tons. There are two tubular boilers, and the heat evolved is guaranteed to evaporate 1 lb. of water to every pound of refuse burned. The surplus steam, it is expected, will be profitably used in connection with the electric lighting station, which occupies the adjoining site.

Mr. M. K. North, Local Government Board Inspector, held an inquiry at Burnham recently into an application by the Urban District Council, to borrow £1200 for the erection of a bandstand, shelter, and public conveniences on the sea front.

At a meeting of the Tobermory Town Council last week Mr. Neil Macdonald submitted plans for an extension of the infectious diseases hospital in the vicinity of the town. He was of opinion that to execute repairs on old buildings would be throwing money away. At present the old building, purchased from a former Parochial Board, would be fitted up to the satisfaction of the burgh Medical Officer for the reception of patients. The extension proposed by Councillor Macdonald would cost from £800 to £1000. A petition from butchers in the town was presented, pointing out that the sewage from the infectious diseases hospital, as intended to be carried out at present, would pollute the stream passing in close proximity to the slaughter-house.

PERSONAL.

Mr. Ponsford Cann has been appointed Medical Officer of Health for Newhaven.

Dr. Sutton has been unanimously re-elected Medical Officer for Sittingbourne.

Dr. Bond has been re-elected Medical Officer for Westbury-on-Severn for another year.

Mr. C. D. Taite, of Southport, has been appointed chief Electrical Engineer for Salford.

Mr. R. Hilton, of Blackburn, has been appointed Town Clerk for Swindon at a salary of £500 per annum.

Mr. G. Pine has been appointed Assistant Sanitary Inspector for Dover at a salary of £2 2s. per week.

Mr. Harper has been reappointed Medical Officer of the Bath rural district at a salary of £160 per annum.

Mr. Amos D. Shrives has been reappointed Sanitary Inspector for the urban district of Farnborough, Hants.

Mr. A. J. Saise has been appointed Inspector of Nuisances for the Uurban District of Kingswood at the same salary.

Dr. Gale has been reappointed Medical Officer of Health, and Mr. S. Jump, Inspector of Nuisances for Norton.

Mr. R. S. Downe, of Liverpool, has been appointed Electrical Engineer for Southport at a salary of £350 per annum.

Mr. Monckton has been reappointed Medical Officer of Health, and Mr. F. H. Smith Inspector of Nuisances for Portishead.

Dr. Smith, of Crawshawbooth, has been appointed Medical Officer for the Rawtenstall borough at a salary of £100 per annum.

Mr. C. V. Hitchins has been reappointed Medical Officer of Health for Weston-super-Mare at an increased salary of £125 per annum.

Dr. W. M. Hamilton, J.P., has been appointed Medical Officer for the Borough of Eccles at a salary of £150 per annum, consequent upon the resignation of Dr. Crocker.

Mr. T. H. Scott, of Edinburgh, has been appointed Burgh Surveyor, Sanitary Inspector, and Water Engineer for Peterhead, in room of Mr. J. Chisholm, appointed to Airdrie.

Dr. John Aitken, Medical Officer for Buckhaven, Methil, and Leven, has been appointed Medical Officer for the borough of Bo'ness during the absence of Dr. Marshall, who has gone to South Africa to act as a civil surgeon.

We understand that Councillor Elliot and Dr. Templeman are to represent Dundee in London at the British Congress on Tuberculosis, and at Eastbourne, where the Royal Institute of Public Health Congress is to be held.

At a recent meeting of the Tenby Town Council a letter from Dr. John Griffith Lock was read, resigning his office of Medical Officer of Health for the borough, which he has held under the Corporation since 1872. Dr. Lock has suffered from ill-health.

Mr. Gerard J. G. Jensen, C.E., it is announced, will give a lecture on "Notes on Domestic Cold Water Supply," at Bury, Lancs, on the 28th inst. The lecture will be given for the Manchester and District Council of the Worshipful Company of Plumbers, and will be delivered in the large lecture-room of the Bury Technical School.

The Finance Committee of the Hampstead Borough Council has reported that Mr. C. H. Lowe, the Surveyor and Engineer, desires to retire, on account of his age and the extra duties he would have to perform under the London Government Act. He was appointed Surveyor of Hampstead in 1871, at a salary of £300 per year, increased to its present figure of £730, and the Committee had made him an offer of an increase to £800 if he had been willing to stay in the Council's service.

LAW CASES.

Houses Built with Insanitary Mortar.

At Cannock, Herbert Foster, of Five Ways, was charged under the Public Health Act with a breach of the bye-laws of the Cannock Urban Council, by erecting some houses at Blackfords with mortar made with water mixed with sewage matter. Evidence was given that in the erection of the walls water had been used taken from a cesspit, into which the sewage from several houses flowed. Notices to pull down the walls had been disregarded and the building continued. The Surveyor said the mortar would be full of bacteria. The Bench said that mortar made with sewage matter must be injurious to health, and made the order to demolish the houses, with costs. As it was a serious matter for the defendant, no penalty was attached.

Failing to Notify Scarlet Fever.

At the Leicester Police-court, Henry Smith, watchmaker, Hathern, was charged with failing to notify scarlet fever in his house on February 12th.

Mr. A. W. Jarratt prosecuted on behalf of the Loughborough Rural District Council, and said that the case was taken under the Infectious Diseases Notification Act. The defendant lived with his wife and seven children, and all of these children had been affected with the disease. In consequence of three of them being away from school the officer visited the house and found that they were suffering from scarlet fever. He reported the case to the Sanitary Inspector, who gave instructions, which were not complied with, as the children were sent on errands, which was a further offence against the Public Health Act. The Rural District Council did not wish to punish the defendant severely, as he was in very poor circumstances. The case was brought with the object of warning others, and bringing before parents their responsibility in the matter.

Mr. Harris, the School Attendance Officer, said that when he called at the house on the date named the defendant said the children were ill, and that he had them all in one room to keep them warm. He further said they had scarlet fever, and the reason he had not notified it was because he did not want to make any bother. He had had a case before.

Edward G. Churchill, Sanitary Inspector to the Rural District Council, spoke to visiting the house, and seeing the children. They were in the "peeling" stage. He gave instructions for isolation and other directions, but these were not carried out, the children having been sent on errands.

Dr. Corcoran, the Medical Officer, said he saw five of the children on whom every symptom of the disease was well marked. They were typical cases. A case had since broken out next door but one to the defendant.

The Chairman said that defendant would be fined 10s., or five days in default. But for what Mr. Jarratt had said, they would have put the extreme penalty upon the defendant. The Magistrates all felt it was a serious thing, and ought to be dealt with as severely as it lay in their power.

Defendant did not appear, and it was stated that he was ill.

NOTES AND QUERIES.

Subscribers may obtain advice on matters appertaining to Public Health Law and Municipal and Sanitary Engineering. Letters should be addressed "Notes and Queries," The Sanitary Record, 5, Fetter-lane, London, E.C. If an answer be required immediately, a stamped addressed envelope must be enclosed

2123.—Footways: Tar-paving: Materials and Thickness.—"Assistant" writes:—(1) "Would you consider a thickness of 2½in. (say 1½in. bottoming and 1in. topping), for a tar-paved footpath, in a street where there is not very heavy traffic, sufficient? (2) Would it be sufficient to lay the material on a bed of engine ashes 1in. thick, or should the bed be of broken stone or brick 3in. thick? (3) Would it be safe to use this material for the paths of a street with a southerly aspect and having a gradient of about 1 in 8, or would the material "creep"? (4) Do you think such a footpath would be more slippery than if paved with York flags? (5) How should the side of the path be supported where it does not abut against a wall or the kerb?"

Answer.—(1) A thickness of 2½in. is usual and sufficient, the separate layers being as suggested. (2) If the foundation be of clean gravel no special preparation is necessary; otherwise a bed of ashes 1in. thick is sufficient. (3) It would be quite "safe" if the tar-paving material be properly made, and there should be no "creeping." (4) No. (5) By a row of ordinary granite setts or kerb, or by edging of 2in. by 4in. yellow deal let into the ground and secured by stakes 2in. by 4in., 1ft. in length, and 6ft. apart.

2124.—Offensive Trades: Nuisance from Burning Refuse.—"C. B." writes:—"In my district there are a number of persons who burn leather refuse, which gives off a very offensive odour from factory chimneys, and from such buildings as greenhouses. The smoke is not, however, black, and therefore Sec. 91 of the Act of 1875 does not apply."

Answer.—Proceedings may be taken under Sec. 114 of the Act of 1875.

2125.—Drainage of Basements and Cellars: Book Recommended.—"E. C." writes:—"Will you please recommend me a good book dealing with the drainage of basements, the floors of which are in some cases below the level of the sewer?"

Answer.—Spinks' "House Drainage," price 5s., is the best book we know of dealing with the subject. It describes how to drain ordinary basements, and also the method to be adopted for raising sewage from basements which cannot be drained into sewers by gravitation. The book may be obtained from the office of this journal.

2126.—Sanitary Acts for Inspectors; Dairies, Books on.—"L. F. S." writes:—"Being engaged in preparation for the Inspectors' examination of the Sanitary Institute, I find it very difficult to summarise the Acts relating to Sanitation. I should be greatly obliged by your informing me if there is such a publication and the price of same. I am also desirous of obtaining a book of sketches of buildings showing the method of construction and draining of a model dairy."

Answer.—The querist will find in Reid's "Practical Sanitation," price 6s., and also in Stockman's "Practical Guide for Sanitary Inspectors," price 5s., an epitome of so much of the law as affects the duties of Sanitary Inspectors. The latter book, in our opinion, will be found the best for the purposes required. Dudley Clarke's "Farm Buildings: their Construction and Arrangement," price 7s. 6d., is the best book we know of dealing with the construction of dairies. Any of the books may be obtained from the office of this journal.

2127.—Nuisance Arising from Absence of Dampcourse: Proceedings.—"Andentes" writes:—"In this district there are some old houses without dampcourses. The walls are very damp. They are not sufficiently bad to be dealt with as unfit for habitation, and it is desired to get dampcourses put in. Can the owner be compelled under Sec. 91, Sub-sec. 1, or other section of the Act of 1875, to put in dampcourses?"

Answer.—Where the walls of a dwelling-house are very damp, as in the case stated by the querist, their condition renders the premises in such a state as to be a nuisance or injurious to health, as defined by Sub-sec. 1 of Sec. 91 of the Act of 1875, and the Local Authority may, by notice served under Sec. 94, require the owner to abate the nuisance by inserting a suitable and sufficient dampcourse, and on his default they may institute proceedings under Secs. 95 and 96.

2128.—Dairies, Cowsheds, and Milkshops Order: Application of.—"Ajax" writes: "Would a person keeping four cows and selling the milk in pennyworths and half-pints, and only supplying his neighbours, come within the provisions of the Order? If so, would his cowshed have to conform to the Model Regulations which are in force in the district, and will he come within the provisions of the Order at all?"

Answer.—As to whether the milkseller comes within the provisions of the Acts, this cannot be determined without a knowledge as to whether the cows are kept mainly for his own use, and the surplus milk is only sold, or whether the cows are kept for the purpose of profit, and whether the whole of the milk obtained therefrom is sold. If the latter, then the Order will apply, and the cowshed should be registered and the Regulations complied with. If the former applies, then the Order and Regulations will not be applicable.

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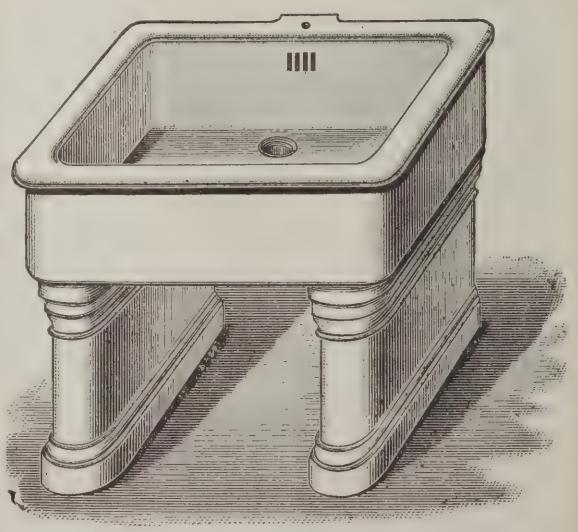

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PUBLIC LIGHTING BY GAS & ELECTRICITY

By W. J. Dibdin, F.I.C., F.C.S.,
Late Chemist and Superintending Gas Examiner to the Metropolitan Board of Works and the London County Council.

(*Continued from page* 224.)

CHAPTER XVII.—MEASUREMENT OF CURRENT.

THREE-WIRE SYSTEM.

While examining the course of a current in a circuit it may be as well to describe the system of wiring for continuous currents, known as the "*three-wire system*," which is being largely adopted at the present time, as it enables higher voltages to be used and twice the number of lamps to be lit with very little extra expenditure in the wiring.

As we have already mentioned, the voltage of the current used for lighting with incandescent lamps may not exceed about 220.

The voltage of alternating currents can be easily and economically raised or lowered, even on a small scale, by means of transformers; but this is not the case with continuous currents, where a transformer can only be economically used in a large installation.

It is, of course, always possible to connect lamps in series, and on the Central London Railway, where the voltage of the current is about 500, five incandescent lamps are connected in series, so that the voltage between the positive and negative terminals of each lamp is only 100. This system, however, is only practicable in exceptional cases, as, besides other disadvantages which it possesses, the five lamps in series must necessarily be inseparable; so that if one is alight all must be alight, and if one burns out or is otherwise extinguished, all will be extinguished. For this reason lamps should always be connected in parallel if possible, in order that any lamp may be switched off without disturbing the rest.

An installation on the three-wire system requires two generators connected in series; or the same effect may be produced with one generator having a double armature, with two commutators and two sets of brushes, but the connections would be the same in either case. Fig. 33 shows the arrangement.

By adopting this system a voltage of, say, 220 can be used for lighting, and 440 for motive purposes, with the advantage that the wires need only be large enough to carry current at 440 volts pressure.

It will be seen that wire *a* leads from the positive terminal of dynamo I, and wire *c* leads to the negative terminal of dynamo II, while wire *b* is neutral; and may conduct current to dynamo I, or from dynamo II, as shown by the dotted arrows on the diagram, according to which side of the circuit requires more current than the other. Examining the course of the current along the whole circuit, it may be assumed that dynamo II generates a current of, say, 220 volts, passing on to dynamo I, which, being wound the same as dynamo II, also generates a current of 220 volts; but as the two dynamos are connected in series, the current passing from one machine to the other is doubled in voltage without increasing in ampères.

An admirable representation of this may be seen in our air pump, Fig. 31, where the back of the piston represents the negative terminal of dynamo II, and the front of the piston the positive terminal of dynamo I, while the wires *a*, *b*, and *c* are represented by the different portions of the pump *a*, *b*, and *c* respectively.

Just as the pressure of the air in the pump at *a* is + 1 lb., at *b* neutral, and at *c* − 1 lb., with 1 lb. difference of pressure between *a* and *b* and between *b* and *c*, and 2 lb. difference of pressure between *a* and *c*, so in the circuit Fig. 33 we have a potential of + 220 volts at *a*, − 220 volts at *c*, and a neutral wire *b*, with a difference of potential of 220 volts between *a* and *b* and between *b* and *c*, and a difference of potential of 440 volts between *a* and *c*.

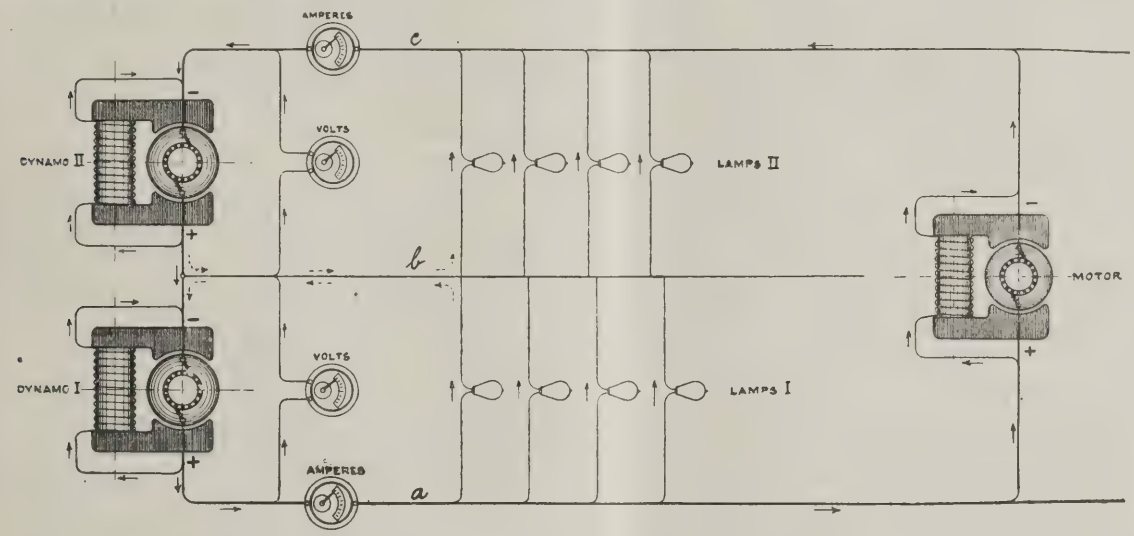


Fig. 33.

The two sets of lamps I and II are merely connected in series; and, if both sets require the same amount of current, no current at all passes along the wire *b* to or from the generators.

But if there were no connection between the wire *b* and the generators, supposing one of the lamps I burned out or otherwise became disconnected, it would at once affect all the lamps II, which would burn very dimly, because the amount of current which the resistance of the three lamps allows to flow through when distributed over the four lamps would be insufficient, but having the wire *b* connected with the generators, the tendency would be for dynamo II to at once yield a sufficient extra amount of current; which, instead of flowing through dynamo I, would flow along wire *b* and through the lamps II to *c*.

In the same way, if one of the lamps II were disconnected, dynamo I would yield an extra amount of current, which would flow from its positive terminal, through the lamps I and along wire *b* to its negative terminal. Thus it will be seen that wire *b* conducts either positive or negative current, and only as much as the difference between that required for lamps I and II; so that very little current ever passes

through it, and only a comparatively thin wire is required.

The difference between the amount of current registered by the ammeters at *a* and at *c* is that which flows along wire *b*.

Motors may be connected from wires *a* to *b*, or from *b* to *c*, in which case a current of 220 volts is supplied to them; or they may be connected, as shown in the diagram, from wires *a* to *c*, thus supplying them with a current of 440 volts.

It is, of course, desirable to keep the resistances on each side of the circuit as nearly equal as possible, in order that both generators may have an equal amount of work to do, and that very much current may not pass along wire *b*, thus necessitating a large sectional area of metal.

(To be continued.)

SANITATION OF THE PORT OF LONDON.

In his half-yearly report on the work of port sanitation, Dr. Collingridge (the Medical Officer of Health for the Port of London) states that during the period under review 15,562 visits of inspection were made to vessels of all classes, 7626 lying in the river and 7936 in the various docks at the time of inspection. Of these, 1230 (equal to 7·8 per cent.) required cleansing. Of the vessels 7938 were from "foreign" ports, and 7624 "coastwise." Of the total number, 12,126 (equal to 77·92 per cent.) carried the British flag, the Norwegian coming next in order of number with 1598 (equal to 10·26 per cent.). Twenty-four sick seamen were referred to hospital on account of non-infectious disease. Structural alterations to the number of 171 were carried out for the improvement of sanitary conditions, these alterations affecting 156 vessels. With respect to barges carrying cargoes injurious or dangerous to the health of those on board, notices were served upon the owners to carry out improvements in order to secure the safety of the crews. The system of medical inspection carried out at Gravesend in conjunction with his Majesty's Customs resulted in 5472 vessels being visited by the boarding Medical Officers. Of these 554 were medically inspected, this process involving the personal examination of 10,124 passengers and 26,940 persons forming their crews. At Sheerness the boarding Medical Officer medically inspected 163 vessels, the previous half-year showing 100 such inspections. In reporting on the outbreak of the plague at Glasgow, Dr. Collingridge refers to the complete arrangements made at the Port of London to cope with any emergency in that direction. The result of the medical inspection of vessels was the removal to the Port Sanitary Hospital of 30 cases of infectious disease, but during the last six months 184 cases were dealt with, comprising one case of cholera, 4 cases of actual or suspected plague, one case of small-pox, 81 of enteric, 19 of diphtheria, 10 of scarlet fever, 56 of measles, and 12 of other diseases. Dr. Collingridge alludes also to a question that was raised by the War-office some months ago with reference to the ordering ashore at Gravesend of some soldiers suffering from enteric fever, who were returning from South Africa. The Military Authorities, at the conclusion of a conference on the subject, admitted that such cases had been rightly removed by the Medical Officer acting under the powers of the Public Health Act. The practical result of the concession is that the cost of maintenance of such cases will fall upon the Government, and not upon the Corporation. During the half-year 40 cases were admitted into the hospital, the total number of days' treatment being 968, and the average number of days for cases (including fatal ones) 21. The average number of patients per day was 5·3, while the average daily cost of maintenance (food and drugs only) was 1s. 8½d. per head. During the last year the officers inspected 655 canal boats within the limits of the port, and these, while registered to carry 2022 persons, were inhabited by 1276 at the time of inspection. In reporting upon condemned food, the Doctor states that, as the work of inspection continues to increase, he proposes to suggest to the Committee an increase of the staff engaged on that important duty.

NEW BYE-LAWS IN SYDNEY.

A number of bye-laws for promoting public health and public decency, for the suppression of nuisances in the city of Sydney, and for other purposes, have recently been issued. The bye-laws, which are very stringent, were sent for approval by Sir Matthew Harris (who fought determinedly to have them passed into law) in November last, and will give the City Council powers, which in the the interests of public health, have been sorely lacking for some years. The bye-laws for the promotion of public health gazetted on September 5th, 1881, have been repealed in favour of those now published.

Amongst the most important are those which provide the following:—

No person shall keep live poultry on any premises in the city, under such conditions as to create a nuisance, or to be dangerous or injurious to health.

No person shall place, throw, or leave any refuse on any premises in the city in such a manner, or for such a time, as to have a tendency to encourage rats or other vermin to visit or frequent such premises.

The owner of any stable, cow-yard, or cattle-shed in the city now constructed, shall cause the same to be paved, flagged, or floored with stone, asphalt, or other material impervious to wet, and to be completely and well drained, and to have proper sewerage connections where available, within one month after service upon him of a notice by the Inspector of Nuisances requiring him so to do.

The occupier of any factory in the city shall, within one month after service upon him of a notice by the Inspector of Nuisances requiring him so to do, cause the smoke arising from the fuel used in the fireplace, stove, or furnace connected with the chimney of such factory to be consumed, as far as practicable, in such chimney.

The occupier of any premises in the city other than a factory, from the chimney of which smoke, noxious fumes, or other matter issue to such an extent as to be a nuisance to the surrounding neighbourhood, shall, within fourteen days after service upon him of a notice by the Inspector of Nuisances requiring him so to do, cause such nuisances to be abated.

No keeper of any second-hand clothes shop shall in the city sell or expose for sale any second-hand clothing unless the same shall first have been thoroughly cleansed or disinfected, and in any proceeding under this bye-law, the onus of proving such cleansing or disinfecting shall be upon the person charged.

Every occupier of premises in the city shall provide and maintain in good order and condition a sufficient number of boxes or bins for the reception of garbage and refuse arising upon such premises, each of which as to material, shape, and size, when filled, shall be reasonably portable by one man, and shall be furnished with a suitable cover; and such occupier shall cause all garbage and refuse arising upon the premises from time to time to be deposited therein, and such boxes or bins to be continuously covered and to be so placed or kept as to be conveniently accessible to the persons engaged in the removal of garbage in the city.

Bye-laws regarding public conveniences are also included in the list. The penalties for any offence under the bye-laws range up to £10.

THE INSTITUTE OF SANITARY ENGINEERS

(Incorporated).

OFFICIAL TRANSACTIONS.

The fifth sessional meeting of the above was held at the Offices of the Society, 64, Chancery-lane, W.C., on Wednesday, March 13th, when the following paper on

"THE CLEANSING OF CESSPOOLS,"

was read, and specially-prepared drawings exhibited, by Mr. A. Taylor Allen (Fellow).

INTRODUCTORY.

I am perfectly aware that a system for the main drainage of towns is one of the important subjects which is undergoing rapid development towards perfection, and that there is a great advantage in having one common outfall, but the fact remains that the drainage of many small towns, villages, hamlets, and detached houses are still drained on what is known as the cesspool system, and in some cases, owing to the question of an outfall, engineering, or other difficulties, which has to be grappled with, a main drainage scheme is delayed, and in the meantime cesspools are predominant.

Owing to the formation of Parish Councils throughout the country more direct interest is taken in sanitary matters by the inhabitants of villages, and more active measures are being taken by Rural Authorities, so I think it is well that we as an Institute, representing various public bodies, should discuss the least objectionable and best sanitary method of cleansing existing cesspools, as upon its thoroughness the health of the district mainly depends.

In this paper I do not propose to deal with the construction of cesspools, but specially as to the cleansing of existing cesspools, and in alluding to a system of emptying that meets all reasonable objections I must ask you to be good enough to accept my remarks and drawings relating to a particular plant, as being given from actual experience with its working, as I do not wish to be considered an advertising medium.

To illustrate my paper I have specially prepared drawings, showing front and back view of several houses in my district, erected before the adoption of bye-laws, which possessed until recently—when the main sewer was extended along the street—a cesspool in each backyard, the only means of access to same being through the house, the estate being so developed as to deprive several houses of a back entrance. This is an exceptional case, I am pleased to state, but I have chosen it to illustrate that a cesspool can be emptied where no back passage exists, without the otherwise spilling and splashing of offensive matter through the dwelling-house, which, previous to my taking up my appointment, was the case, the work of cesspool emptying being carried out in a very unsatisfactory and filthy manner, and I was instrumental in the Council themselves undertaking to empty and cleanse cesspools wherever they existed in the district, out of the rates, on the system explained in following sections. At the time of writing my paper the main-drainage scheme for the *whole* district is in working order, so that the work for the plant during the present year will consist of emptying every existing cesspool previous to being filled up and a connection made to the new sewer, afterwards I propose using the vans for flushing the sewers, as they are well adapted for this purpose, and the hose will be of service in flushing the sewers direct from the water hydrants.

STATUTORY POWERS.

Drainage into cesspools is permissible under Secs. 23 and 25 Public Health Act, 1875.

Under Sec. 42 every Local Authority may, and when required by order of the Local Government Board *shall*, themselves undertake or contract for the cleansing of cesspools.

Under Sec. 44, where the Local Authority do *not* themselves undertake or contract for the cleansing of cesspools, they may make bye-laws imposing the duty of cleansing on the occupier of the premises.

Sec. 47 provides that any person in any *urban* district who allows the contents of any cesspool to overflow or soak therefrom shall be liable to a penalty not exceeding forty shillings, and further provides that the Local Authority *shall* abate, or cause to be abated, every such nuisance, and may recover in a summary manner the expenses of so doing.

Here I wish to point out that the recovery of the expense of abating the nuisance under this section is from the *occupier*, but if proceedings be taken *under Sec.* 91, Sub-section 1 or 4, of the same Act, recourse is given against the *owner*.

Sec. 41 appears to me to be affecting nuisances arising from defective construction rather than from want of cleansing. There is yet another section in the 1875 Act referring to cleansing of cesspools. It is Sec. 40, "Every Local Authority *shall* provide that all drains, water-closets, earth-closets, ashpits, and *cesspools*, within their district be constructed and *kept* so as not to be a nuisance or injurious to health."

This section should receive much earnest attention, as it imposes a duty upon the Authority with reference to nuisances arising from *temporary* defects.

In districts where the Local Authority themselves undertake or contract for the cleansing of cesspools, under Sec. 42 of the 1875 Act, the fact that a daily penalty can be enforced upon a Local Authority failing (without reasonable excuse) to perform such work within seven days from the receipt of a written notice from the occupier thereof, is worthy of serious attention.

Sec. 27 empowers either *Urban* or *Rural* Authorities for the purpose of receiving, storing, disinfecting, distributing, or otherwise disposing of sewage.

(2) To contract for the use of purchase, or take on lease any land, buildings, engines, materials, or apparatus, either within or without their district.

PROCEDURE UNDER PUBLIC HEALTH ACT.

I think it will be generally admitted that the procedure necessary to be taken for the cleansing or overflowing of a cesspool is a long and troublesome one, and considerable tact is required by the sanitary officer, inasmuch as it is necessary for him to acquaint himself with the circumstances of the case; for instance, a mere overflow from a gulley at the upper end of the drain is not always an indication that the cesspool is full and requires cleansing.

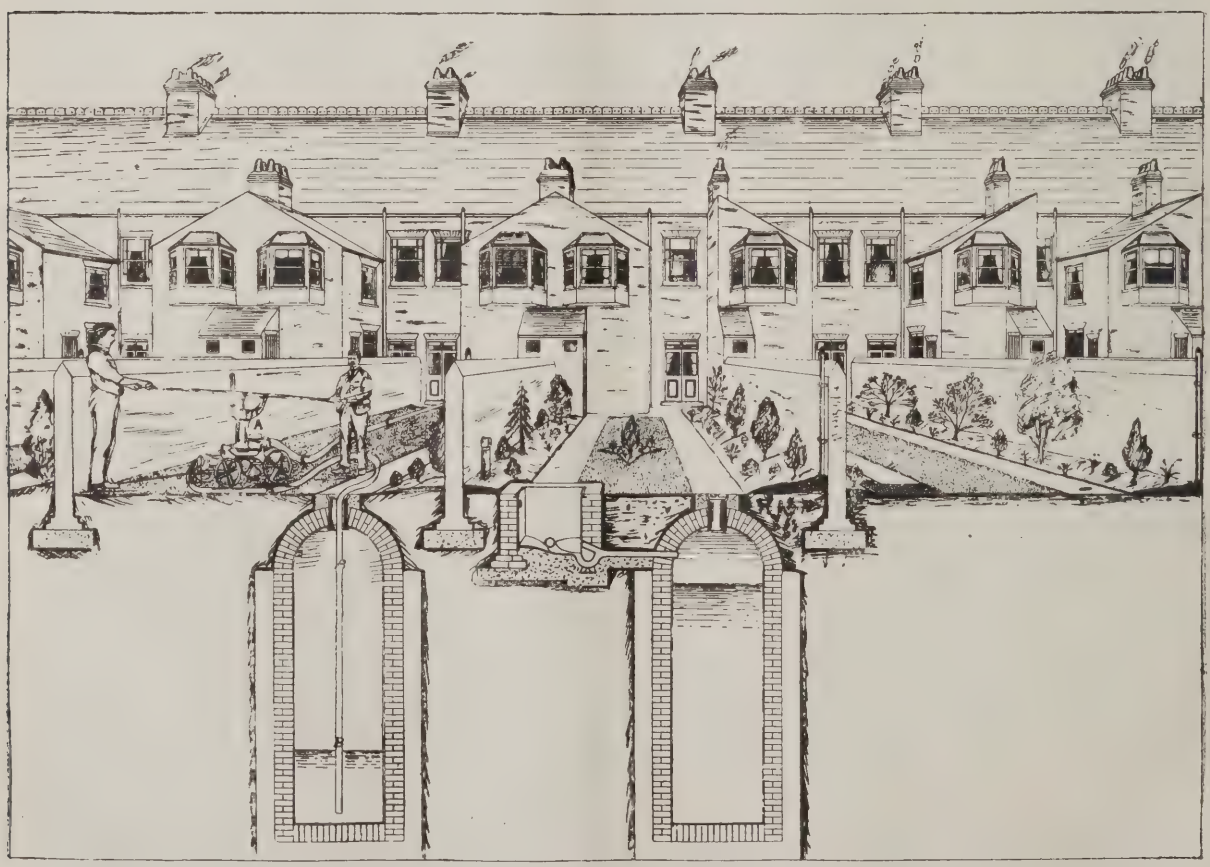
The form of notice usually supplied is necessarily copiously shown with "blanks," directions for filling up. In the operative part the following direction is given:—"Here specify any things required to be done or works required to be executed."

I have grave doubts whether a notice simply directing the owner or occupier (as the case may be) "to take such steps as may be necessary to abate the said nuisance" would be good and valid. It appears to me important that the notice should specify if the drains are to be cleared or the cesspool cleansed.

Failure to abate the nuisance, a complaint relating to such nuisance has to be made before a justice, who shall thereupon issue a summons; then the necessary information has to be obtained for the proceedings in a court of summary jurisdiction, and if the Court is satisfied that the alleged nuisance exists they shall make an order on such person, requiring him to comply with all, or any of the requisitions of the notice, or otherwise to abate the nuisance within a specified time. In the meantime the nuisance may exist, and the premises have to be visited to ascertain if the notice has been complied with; and what I wish to lay stress on is

"THE CLEANSING OF CESSPOOLS."

Emptying Cesspools of Houses having no Back Entrance—Front View.



Emptying Cesspools of Houses having no Back Entrance—Back View.

this: Has the notice been obeyed? The nuisance from an overflowing cesspool may have been abated, but has the cesspool been cleansed in the same manner, and as efficiently as the Local Authority would do it themselves if they undertook the work?

If the cesspool is a source of trouble and expense to the owner there is a possibility of his digging (unaware to the Authority) another cesspool in close proximity to the *ever-filling* one, and connecting the two by a few pipes. I am of strong opinion that the cleansing of cesspools should be as much the work of the Authority under Sec. 42 Public Health Act, 1875, as removal of house refuse under the same section.

In acting upon this principle it is, I think, clear that the district would be kept in a more sanitary condition, and instead of the officer having to find out when a cesspool was full, the occupier would gladly send him a notice to that effect.

OLD METHOD OF CLEANSING.

By the old method I do not mean that adopted by the owners of country residences and isolated houses in having a pump of simple mechanism construction fixed to the cesspool for utilising the contents on their own ground, but I refer more particularly to the usage of the carts known as "soil carts," which though a very primitive and insanitary mode, is still employed.

The plant consists of either a liquid-manure tank on wheels, or a tumbler cart suspended on the axle, so that it can be turned over to discharge its load by means of a rack and pinion, with wood or iron lids, and several buckets, with a rope or chain, and in some cases a ladder or a pump is employed. The buckets are filled and carried by the men to the cart, which remains open during the filling process, consequently the odour arising from this penetrates into the neighbourhood.

I think you will all agree with me that this system is one which should not be encouraged in the present day of sanitary reform, but that the consideration of a better scheme for cleansing cesspools is worthy of discussion.

ITS DISADVANTAGES.

(1) The cesspool cannot be emptied and cleansed without an opening being made, usually sufficiently large for a man to enter the cesspool; (2) the fact that a cesspool while being emptied must necessarily remain open for several hours; (3) the splashing of the sewage by the men in conveying the buckets from the cesspool to the carts and around the cesspool; (4) the danger the men are exposed to, and liability of their contracting disease; (5) the work being done at night time, when the proper supervision it should have is not forthcoming, owing to (*a*) insufficiency of light; (*b*) officials being off duty; (6) the non-guarantee of the cesspool being properly cleansed; (7) conveyance through dwelling-houses where no back entrance exists; (8) the unpleasant features, and considerable cost; (9) length of time occupied in emptying the cesspool (usually more than one night).

COST.

I know of owners who have paid as much as £6 on several occasions for emptying their cesspool.

Laxton, in his reliable Price-book, has given 16s. *per load* as a contract price for emptying cesspools. For a cesspool 3ft. 6in. diameter with 18ft. of sewage in it (1080 gallons or thereabouts), which would mean approximately six *loads*, as it must be borne in mind the old-fashioned soil cart cannot be filled, owing to the tilting and spilling of the contents, the cost would be £4 16s.

Allowing six gallons the minimum consumption of water for a household per day, and assuming the cesspool to be constructed under bye-laws approved by the Local Government Board (being practically water-tight), the cesspool would require emptying twice a year, costing the owner between £8 and £12 a year.

It is quite possible for an owner to be charged less, or secure a lower quotation for emptying his cesspool on this system, but to say that the contractor would guarantee, or the men stay long enough to empty the cesspool, is another matter. As a new cesspool could be dug and steined for £3 12s., it is only reasonable to expect that there would be a tendency among owners to dig and stein a new cesspool rather than to be continually emptying the old one.

(*To be continued.*

OLD WALL PAPERS AND THE DANGER OF INFECTION.

At a recent meeting of the Glasgow Corporation, Mr. Shaw Maxwell said he observed from the minutes that a letter had been read from the secretary of the Glasgow United Trades Council, intimating that at a meeting of that body complaints had been made by the painters' delegate of the manner in which (1) the houses of the working classes are re-papered, the old paper being simply covered over instead of being stripped off, and (2) closets are whitewashed without the walls being first washed down. He noticed that the committee agreed to allow the matter to lie on the table, but it seemed to him that these two suggestions were of an eminently common-sense character, and he would be glad to know why greater consideration was not given to them.

Mr. Dick replied that they had only powers in the case of infectious disease to compel parties to do so, and in the case of infectious disease they always insisted upon this being done. When it came to the others they had no powers, and they would require to get them when the proper time arrived.

Mr. Shaw Maxwell said it seemed to him that the time had come, and that the sooner they got the powers the better. He went on to call attention to a case in which a whole family of five persons had been compulsorily removed to the Weaver-street Reception Rooms, and inquired if this principle of compulsory removal applied equally to all citizens who might be in contact with the disease of small-pox, irrespective of locality, place, condition, or social position.

Mr. Dick, in reply, stated that if the Medical Officer of Health considered it necessary to do so, he had power to apply for a warrant. The family in question consented to their own removal before a warrant required to be applied for.

Mr. Jeffrey Hunter said he was not satisfied with the answer given by Mr. Dick in regard to the re-papering question. He thought the committee had treated this very important communication from the Trades Council in a rather cavalier manner. As Bailie Robt. Anderson knew, painters were the most careless class of tradesmen we had, and this vicious habit of putting on five or six papers, one on top of the other, should be discontinued.

Mr. Robert Anderson remarked that he had no desire to controvert what Mr. Hunter had so unwarrantably said regarding painters. It was sufficient that painters were always willing and desirous to do what they were paid for, but they had no intention of doing what they were not paid for. The onus of this particular evil lay on the proprietors. He had spoken to the convener in the forenoon regarding this paragraph, and had been assured by him that it was not the intention of the committee to allow this matter to drop, and he did not think they should allow it to drop. The number of five or six papers mentioned did not in any way represent the real state of matters in many cases. He had, in his own experience, seen seventeen papers taken off a wall: and there was no more fruitful source of infection, especially to painters, than the removal of those old papers, which might in years past have covered up infection.

PROBLEMS OF DOMESTIC SANITATION.*

By Dr. A. Inglis, M.O.H., Maybole.

There are two sides to almost every question of public health, as the following remarks will show, and these may be taken as fairly typical of the state of matters throughout the United Kingdom. Various circumstances, particularly the present widespread epidemic of small-pox, which is pretty general throughout the more populous portion of Scotland, and last year's outbreak of alleged plague have influenced the public mind in the direction more particularly of domestic sanitation. This very comprehensive subject includes the thorough renovation of all dwellings, which should be enjoined by statute upon proprietors, to be carried out at least every three or four years, or oftener where the particular circumstances necessitate. All passages should be whitewashed once in six months, woodwork should be scraped and painted afresh annually, kitchens should also be whitewashed every six months, and rooms re-papered every two or three years, unless the paper used be of a superior quality. In the matters of painting, whitewashing, and papering, no scamping should be permitted. Ceilings and walls should be thoroughly scraped before treatment. Per contra, the occupiers should also exercise diligence in the cleaning of rooms, stairs, and passages, and daily ventilation should be insisted upon. There are many tenants, and these often by no means of the poorest classes, who would soon turn a palatial residence into an insanitary pig-sty, to the hurt and nuisance of themselves and neighbours. There is need of a much more inflexible procedure with regard to uninhabitable houses than there has been in the past. The detection of insanitary conditions is frequently followed by the remonstrance—"But there have been no complaints made." The reason of this may sometimes be due to indifference on the part of the tenant, but more often is traceable to the scarcity of suitable houses for the industrial classes. This leads to a competition, a grim and awful struggle for existence, in fact, for the possession of a few putrescent and decaying shanties by those who can pay but a small rent, and the would-be occupier who makes the fewest complaints, and never asks for repairs, collars, of course, the prize, a state of matters truly pitiable in this age of civilisation—imperialism, expansion of territory, and overcrowding.

The thorough cleansing of courts, entries, and streets, is also important. The clearing away of waste paper, orange skin, and mud, which in bad weather collect and form a nidus of putrefaction, might well give employment to a casual labourer, armed with a broom, and anxious to earn a few pence by the job. This nuisance of expectoration upon the footpaths may, in dry weather, cause a dissemination of the tubercular bacillus, and is often as dangerous to the feet of the unwary pedestrian as orange peel. The nuisance can scarcely be effectually dealt with, until the great tribe of the Yahoo—alias Hooligan—which buttress up the street corners, and squirt the juice of rank tobacco to the obstruction and annoyance of peaceable citizens, are provided with suitable stanchioned residences in the nearest Zoological Gardens, as objects of curiosity to the intelligent foreigner. Not for the benefit of the Budget, but for the good of the very uprising generation, I would briefly mention the dangers of juvenile smoking, which impairs the physique and morals of five-year old men, who do not whistle as in the olden times on account of the obstruction caused by three-a-penny "fags." The sale of tobacco to persons under sixteen years should be prohibited by statute. The liberty of the subject must be regulated for the subject's own good. There can be no doubt that premature indulgence in alcohol or tobacco by weakening vitality, causes predisposition to heart disease and consumption.

It is alleged by many parents that the School Board is largely responsible for the spread of such diseases as measles and whooping-cough, by insisting on the return of scholars before they are free from the danger of giving infection. This is a matter which calls for investigation, with the object of either refutation or amendment, for measles and whooping-cough, although not notifiable, are nevertheless infectious diseases, and may sometimes be fatal to the very young. It is not enough to pass the matter over as mere "children's diseases." Small-pox was, a century ago, mostly a disease of children, and surely other infectious diseases as dangerous as, though more common now-a-days than, small-pox, merit at least an equal share of attention with the more exotic disease in regard to prophylaxis. In regard to other general matters affecting the public health, I would, for example, recommend that British barbers should adopt, for the benefit of themselves and customers, the antiseptic system used largely on the Continent and in some parts of America. Their razors, scissors, and other implements should be sterilised by passing these over a gas burner or spirit lamp. All brushes should be steeped in carbolic or other disinfectant solution, and each customer should have a clean boiled napkin or towel around his neck. The importance of these measures cannot be gainsaid.

There is a good deal of reason in some remarks lately appearing in the lay Press as to the construction of men's waistcoats, these being a front of good cloth and a back of some flimsy and inadequate material. This is utterly opposed to all principles of rational dress, both from the hygienic and common-sense point of view, as the coat, being frequently worn open across the chest, cold air finds its way round to the back, setting up in many instances pulmonary complaints—lumbago, rheumatism, and many of the other ills which flesh need not necessarily be heir to. The inspection and analysis of milk and the penalties frequently following thereon, are indeed excellent moves towards receiving the pure article; but how often are these measures simply and absolutely nullified by the consumers themselves. In spite of the proud boast that "Britons never shall be slaves," it is to be feared that many of the brave and the free are at times "Led willing captives of the giant sloth," so that, instead of a clean and possibly scalded receptacle for the lacteal fluid, there is often a residuum of the milk of other days in the bottom of the jug. This, with a few hours' stay in an overheated and presumably malodorous kitchen, would quickly sour the sweetest milk fresh from the cow, and might well account for infantile diarrhœa, with the usual remark that "the child is not thriving," until its sufferings are finally and mercifully ended. I am of opinion that leaflets distributed to the public as to the method of storage of milk might not be in vain.

It is also asserted on the best medical authority that the Sacramental cup may be an unsuspected means of spreading such diseases as tuberculosis, which consequences attending the use of a cup passed round in common were surely never intended by the Almighty, especially when it is borne in mind that many of the old Mosaic laws were founded on a sanitary basis. It is suggested that the dispensing of the wine in capsules would fulfil the provisions of the ordinance, and that without giving offence to anyone concerned. In a word, careful observance of the laws of health, moderation in all things, especially in eating and drinking, regular outdoor exercise, frequent bathing and other ablutions, healthy homes, and the maintenance of these in such condition and the inculcation of these things upon children, both by precept and example, will tend towards the perpetuity of the race, and "do far more to banish sickness from the cottage home" than all the serums and disinfectants in or out of the Pharmacopœia.

*Annual Report, 1900.

DUST DESTRUCTORS.

At the St. Bride Foundation Institute, Fleet-street, under the auspices of the Association of Parochial Engineers and Engineers-in-Charge, Mr. C. Newton Russell, A.M.I.C.E., recently gave an interesting lecture on "Dust Destructors." In the course of his lecture, which was illustrated with lantern views and diagrams, Mr. Russell remarked that the problem of disposing of towns' refuse has exercised the minds of those connected with municipal affairs for many years. The old system of shooting rubbish on vacant plots of land, which offers the easiest and cheapest way out of the difficulty, is doomed, as it is now generally recognised that in order to deal with the problem in a really satisfactory manner, the first requirement is that of sanitation. Burning refuse is a much more expensive way of dealing with it than shooting it on the land, but the hygienic benefit is of such incalculable value to the public health that the matter of cost should be of secondary importance.

The subject appears to have first been tackled seriously by Mr. Alfred Fryer, who more than twenty years ago was the first to do anything in a practical way; in fact, it may be safely said that the destructors of to-day are the result of that gentleman's foresight. To prove the old saying, "nothing new under the sun," Mr. Fryer quoted the tradition that the fires of Tophet received the burnable refuse of Jerusalem. In giving a detailed description of the Shoreditch destructor, the lecturer stated that the average amount of refuse received per day is 84 tons, delivered between 9 a.m. and 5 p.m., although occasionally as many as 140 tons have been delivered in one day. As it is impossible to guarantee a regular supply, storage is provided to cope with extra large deliveries by means of a large bin under the tipping platform, holding about 60 tons of refuse. The lifts and tip trucks are worked entirely by electricity, and are found to act well. The record time required to deal with each load of refuse shot into the lifts, raised to the top platform, tipped, and the empty truck returned to the starting point, in seven minutes, the average time being about nine minutes. Provision for the rapid shooting of garbage is important, as the vans usually arrive in batches.

In order to give an indication of the temperature reached in steam-raising destructor plants, Mr. Russell mentioned that he has selected a number of articles which have passed through the furnaces, from which it appears that such metals as cast steel, cast and wrought iron, copper, brass, &c., frequently reach a molten state. The highest temperature noted in this way is the fusing point of cast steel, viz., 2500 deg. Fah. The furnaces have now been in daily use for nearly four years, and it is interesting to find that the fire-bars are in good condition, and show very little sign of deterioration. The fire-brick linings of the furnaces are found to last well, and do not often require renewing. The boiler feed is furnished by a Weir pump, which forces the cold water through a Green's economiser, where it is heated to a temperature varying with the load. It is then forced into the thermal storage vessel—a cylindrical shell, 30ft. by 8ft.—from which the boilers are fed directly by gravity. Most of the lime deposit in the water comes down in this storage vessel, the amount taken out after a run of seven months weighing little short of a ton after it was dried. This system of feed storage has undoubtedly helped considerably to the success of the plant generally.

Another interesting point mentioned by Mr. Russell is that coal is never mixed with the refuse, but is burned separately on the ordinary grate immediately under the boiler tubes. The residue at present produced at Shoreditch represents about 33 per cent. of the amount of refuse burned. The clinker produced—which is rather softer than that produced at non-steam-raising destructors—and the fine ash are used for making mortar, concrete, and artificial paving stone. The stone consists of $2\frac{1}{2}$ parts ground clinker to one of Portland cement ground very fine and pressed to $1\frac{1}{2}$ tons on the square inch. A sample of slab when supported at its ends sustained a weight of 2221 lb. before breaking. The flue dust may be used as the basis of disinfecting powder, and is sold for a nominal sum per ton. In conclusion, Mr. Russell said he was strongly of opinion that to get the best efficiency out of refuse furnaces they should not be combined with coal fires, as when the steam from both sources is mixed in a common steam pipe it is difficult to allocate any carelessness. This point will be appreciated more when it is remembered that about ten tons of refuse has to be handled to get the same result as with one ton of coal, even when the latter is quite handy. Mr. Russell also gave the opinion that the extreme limit of percentage to which ordinary refuse can be reduced by burning is not near reached, the present lowest being 25 or 30 per cent. Having lately given considerable attention to this point, he was pleased to be able to say that it is quite possible to reduce the percentage of clinker down to 10 per cent., but as the new process was not fully developed, he was unable to give details.

INCORPORATED SOCIETY OF MEDICAL OFFICERS OF HEALTH.

YORKSHIRE.

Members of the Yorkshire branch of the Incorporated Society of Medical Officers of Health had their annual dinner on Thursday evening last at the Hotel Metropole, Leeds, about fifty medical gentlemen from various parts of the county being present. Dr. W. L. Hunter, of Pudsey, presided. The invited guests included Dr. G. Vivian Poore (London), Mr. R. E. Bicknell of the Local Government Board, Dr. Peter MacGregor (Huddersfield), and several chairmen of Sanitary Committees in Yorks.

In proposing the toast of "The Public Health Service," Dr. Vivian Poore made special reference to the reports of Inspectors of the Local Government Board, expressing regret that these were not made more accessible to the general public.

Mr. R. E. Bicknell, M. Inst. C.E., briefly replied. Touching on the great housing question, he said that when Sanitary Authorities realised the very large powers they already possessed, progress would become general.

Dr. J. R. Kaye, hon. secretary, also responded.

Dr. J. Spottiswoode Cameron gave the toast of "The Sanitary Authorities of Yorkshire." Councillor E. E. Lawson, chairman of the Leeds Corporation Sanitary Committee, and Alderman J. E. Goodall, chairman of the Pudsey Sanitary Committee, replied.

"This Society" was submitted by Dr. Peter MacGregor, who urged that their great aim should be to educate not only the people, but the Sanitary Authorities, and even the Legislature, on health matters. He claimed that the serious attention of Medical Officers should be given to other diseases besides those which are strongly infectious or arise directly from insanitary conditions, and he specially instanced cancer and functional disease of the nervous system. Both these diseases, he remarked, were growing to an alarming extent in the West Riding.

Dr. T. A. Green, of Meltham, responded.

Earlier in the day, members of the Society had an opportunity of visiting and inspecting the Leeds sewage works at Knostrop.

The Corporation of Portsmouth has decided to borrow £90,000 for additional works of outfall drainage, and £32,000 for electric lighting works.

MECHANICAL AIDS TO DISINFECTION.

The science of disinfection has made rapid strides in recent years, and the introduction of formaldehyde has to some extent revolutionised its methods. Until recently, however, there were no mechanical appliances for the scientific distribution of this disinfectant on the market at reasonable figures. The Sanitas Company, Limited, of Bethnal Green, in order to meet the want, have introduced several distinct inventions, two of which are termed "Formic - Sulphugators," ingeniously contrived appliances which generate sulphurous acid gas (sulphur-dioxide) in conjunction with the vapours of Formaldehyde. As our readers are aware, carefully-conducted investigations have demonstrated the fact that disinfection with Formic-aldehyde vapour is but slightly superior to disinfection with sulphurous acid. By the use of "Formic-Sulphugators" the two methods are combined, and hence double security is assured. The heat generated by the burning sulphur is utilised to generate "Formic aldehyde" from a suitable (solid) combination, and both the sulphurous acid and "Formic-aldehyde" are generated in association with aqueous vapour in such manner that they are chemically compatible, and the full power of their several disinfective values is realised. These appliances retail at 1s. and 1s. 6d. respectively. The former (Fig. 1) consists of a double tin, the inner one (*b*) containing a sulphur candle, or fumigator, provided with a lighter (*c*), while in the outer one there is a preparation of Para-formaldehyde with other inert material. Before use, water—or a solution of Formaldehyde if preferred—is poured on to the top of the material in (*a*) until it is no longer soaked up. Upon lighting the sulphur candle, the heat which is generated thereby gradually causes the vaporisation of the disinfectant material contained in the vessel (*a*), and thus gives rise to a steady current of Formaldehyde vapour in association with steam and sulphurous acid. One such "Formic-Sulphugator" is sufficient to thoroughly disinfect any room of ordinary size (up to say 2000 cubic feet capacity), using water in (*a*). For larger apartments the water should be replaced by a solution of 40 per cent. Formaldehyde. Fig. 2 consists of three combined tins, the inner one (*a*) of which contains a preparation of Para-formaldehyde from which that substance is vaporised by the heat of the burning sulphur candle (*b*) provided with a lighter (*f*). The fumes of the Para-formaldehyde pass along and out from the tube (*d*) which is connected to the lid of cover (*e*). Into the outer vessel (*c*) water, or a solution of Formaldehyde, is poured, until the surface of it nearly reaches the level of the sulphur candle. In use, sulphurous acid gas is generated in association with the vapour of Para-formaldehyde and steam, while if a solution of Formaldehyde is placed in (*c*) instead of water, that disinfectant is also vaporised at the same time. It is not necessary, however, to use a solution of Formaldehyde in place of water except in cases where the room or apartment to be disinfected is larger than an ordinary room. For each extra 1000 cubic feet of space—above and beyond the cubical capacity of an ordinary room—there may be placed in the vessel (*c*), instead of water, a quarter pint of a 40 per cent. solution of Formaldehyde. Although but recently introduced, these "Formic-Sulphugators" have already met with unqualified

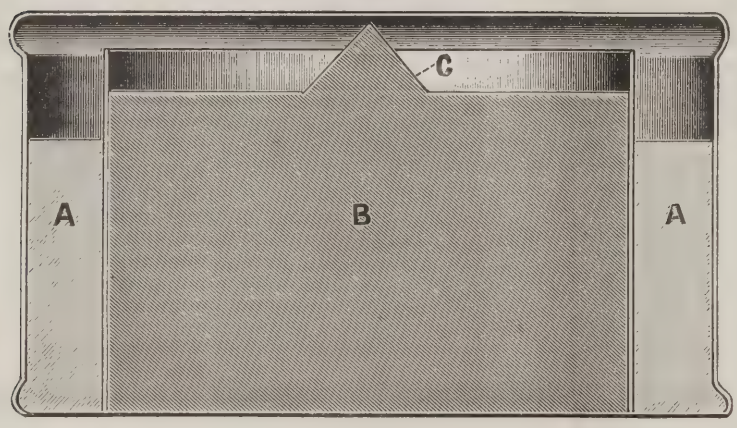


Fig. 1.

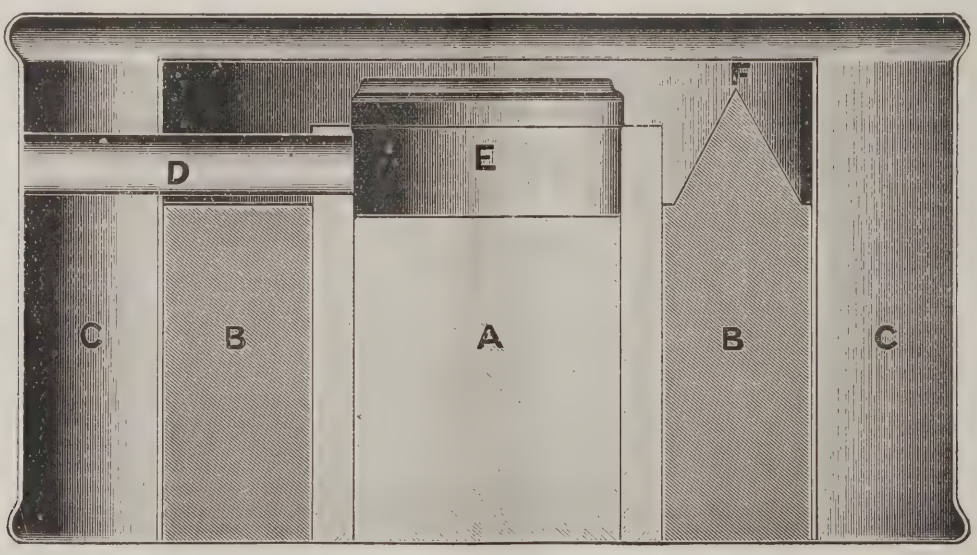


Fig. 2.

approval from a large number of Medical Officers of Health, and others interested in public disinfection, not only on account of their reliability, but their portability, safety, and, last, but by no means least, their economy. The apparatus though characterised by simplicity is nevertheless strikingly ingenious, and one can imagine no appliance better adapted for the use of Public Health Authorities, to whose attention we unhesitatingly commend it.

BOSTON RURAL DISTRICT COUNCIL AND ITS M.O.H.

EXTRAORDINARY ACTION.

At the last meeting of the Boston Rural District Council, Mr. F. E. Bowser presiding, the claim for 7s. 6d. by Dr. A. Tuxford, M.D., the Medical Officer, for notifying three cases of infectious disease at Hubbert's Bridge and Kirton Holme was further considered. At the previous meeting the Clerk reported that fees for the same three cases were also charged by Dr. White, of Swineshead, and the matter was adjourned for further consideration. Dr. Tuxford now wrote stating that he had communicated with the editor of the *Lancet* on the subject, and he was of opinion that he (Dr. Tuxford) was entitled to charge the fees, as he was called to visit the cases. If the Council, however, felt any diffidence about paying, he was willing to waive the claim. All he desired to do was to establish his right to make the claim, and this he considered he had done.

Mr. James Brown, the representative for Wyberton, moved that the amount be not paid. The Medical Officer, he said, was paid a stipulated salary for discharging his duties, and he had no right to charge extra fees.

Mr. Clarke seconded the proposition, and it was carried.

The Clerk, in reply to Mr. Maltby, said he was of opinion that Dr. Tuxford's was not a legal claim. Every medical practitioner attending a case of infectious disease was bound to make a notification, for which he was entitled to charge a fee, but that did not apply to the Medical Officer of Health, who visited the cases in his official capacity and by direction of the Sanitary Inspector.

The next business was to appoint a Medical Officer of Health.

Mr. J. Clarke proposed that the appointment be advertised, and said that he, like a good many more, was not satisfied with the present officer.

Mr. J. Brown seconded the motion, and in most eloquent terms severely criticised the action of Dr. Tuxford, and especially referred to his report.

Mr. Jas. Eley proposed that Dr. Tuxford be re-appointed, and contended that the Medical Officer had merely discharged his duty.

Canon Staffurth seconded the amendment. Dr. Tuxford's report might not be agreeable, but they could not deny its truthfulness. To dismiss him because his report did not please them savoured of Eastern customs rather than Western methods. If a doctor presented a report on the health of the Sultan which did not please his Excellency, he (the doctor) was handed over to the Eunuch and punished, and it seemed as though the Council wished to treat their Medical Officer in a similar manner.

Mr. Upsall supported the amendment. It would be frivolous to dismiss the Medical Officer in pique, and he did not think they would be able to give a very satisfactory answer to the Local Government Board.

On a division the proposition was carried by ten votes to nine, and it was decided to advertise, and to make the appointment on Saturday week.

National Health Society.

OFFICIAL TRANSACTIONS.

Elementary Examinations.—The following are short reports of examinations recently held in Bedfordshire and Lincolnshire, in both of which counties the Society's teachers have been engaged for some successive years:—

In *Bedfordshire* 107 candidates from five centres presented themselves for examinations in Nursing, First Aid, and Health. This is perhaps the largest number of candidates ever examined by the Society's examiners in one county during a week, which is in itself a testimony to the amount of interest taken in the teaching by the people in this county. The examiner speaks highly of the work of the candidates, and only nine out of the entire number failed to reach the required standard. The village of Silsoe is especially mentioned in the report; the examination in this centre was on "Health," which is usually regarded as less attractive and interesting than the other subjects dealt with by the Society's teachers, but the candidates in this case showed a keen appreciation of the instruction they had received, and all succeeded in passing the examination most satisfactorily.

Lincolnshire.—Fifty-six candidates presented themselves for examination in five centres in Lincolnshire on March 11th and following days, and of this number forty-seven have succeeded in obtaining the Society's elementary certificate for "Nursing," "First Aid," and "Health." The examiner speaks well of the high efficiency of the candidates, but mentions that those examined in "First Aid" attained a higher standard than candidates on either of the other subjects.

Training Lectures.—On Wednesday, March 27th, Mr. F. Stockman will commence his course of instruction on "Building Construction" for the Society's training students. These lectures will be given at three p.m. at 53, Berners-street.

The subject of Dr. Squire's lecture on Physiology on Tuesday next, April 2nd, will be "The Respiratory System."

THE ALLEGED INSANITARY CONDITION OF H.M.S. BRITANNIA.

Dr. J. W. Fisher, Medical Inspector-General of the Navy, and Professor Corfield, London University Hospital, the Admiralty Commissioners appointed to inspect the Britannia, are stated, on excellent authority, to have arrived at the conclusion, after a thorough investigation, that the ship should be retained, at all events for some time to come, and that although there are minor defects, which they recommend should be remedied at once, there is nothing in the sanitary condition of the ship to injuriously affect the health of the cadets. The present Britannia is not the ship originally stationed at Dartmouth, but took her place some twenty or more years ago. At that time she was a new vessel. Examinations by boring and in other ways convinced the experts that so far from being rotten, as was stated by one individual during the correspondence, she is practically sound. Alterations to the studies and sleeping berths are, it is understood, suggested, and in all probability, with certain other improvements, will be carried out without delay.

The following letter has been addressed to the editor of the *Times*, on the subject of the sanitary condition of Dartmouth by the Town Clerk (Mr. O. S. Bartlett) at the request of the Corporation:—

Dartmouth, March 14th, 1901

Sir,—I am directed by the Town Council of this borough to write you with reference to the corre-

spondence which has recently appeared in your columns as to the sanitary condition of Dartmouth.

Referring to the letter of your correspondent in answer to that of Mr. Councillor Ditcham, I am desired to state that the cases of infectious diseases therein referred to as notified within a period of a few weeks are cases of measles among children, measles and chicken-pox, which are not mentioned in the Infectious Diseases Notification Act, and which are not generally notifiable, being in this town notifiable diseases, Dartmouth in this respect occupying an almost unique position.

Epidemics of measles, as is well known, occur periodically, at intervals of a few years almost everywhere. The recent epidemic at Dartmouth was one of these, and the disease has been of a very mild type.

The schools were closed by the order of the Town Council as soon as the disease was found to be epidemic, and this course has been attended with very satisfactory results.

During the time the Britannia has been at Dartmouth, a period of thirty-seven years, there have only been (including deaths from drowning and as the result of accident) eleven deaths of cadets on the ship or in the hospital connected therewith, a number which will compare favourably with the number of deaths at any public school of the same size. I may mention that there are now over 280 cadets belonging to the ship, and not 235, as stated by your correspondent. In this connection, too, it should be borne in mind that while at public schools boys are generally sent home when ill, they are, when on board the Britannia, relegated to sick quarters.

The allegation that the tidal water drives the sewage back into the town is incorrect, as the mode in which the sewers are constructed renders this an absolute impossibility.

The statement that cases of eczema are common in Dartmouth is, as I am enabled to state on the authority of the Medical Officer of Health, absolutely without the slighest foundation in fact, and the Council can only regard the allegation that children are disfigured by it as made maliciously.

That the health of Dartmouth will compare favourably with that of any other town of its size in the kingdom is conclusively shown by its death-rate, the deaths during the past ten years having averaged only 99 per annum, being at the rate of 16·5 per 1000 of the estimated population.

The Council do not consider that it falls within their province to say anything with reference to the Britannia, but they are confident that everything is being done by the Admiralty that can possibly be done to ensure proper sanitary conditions on board that ship.

Onesimus S. Bartlett, Town Clerk.

It is stated that the report of the Board of Visitors appointed by the Secretary for War for the inspection of the Royal Military Academy, Woolwich, is favourable so far as the lads personally are concerned, but the Board considers that the barrack accommodation is not satisfactory, some cadets having single rooms, whereas others are placed three or four in rooms which are so small that no cubical arrangement is possible.

The new Birmingham typhoid fever hospital was opened last week, when the hospital at Little Bromwich became available for the reception of patients. Till recently the hospital had been used for convalescent cases of scarlet fever. The building has now been thoroughly cleansed and disinfected, and additional nurses have been appointed, an important provision under this head being the appointment of a night nurse. The hospital will accommodate 100 patients, though it is hoped the whole of this accommodation will not be required.

REVIEWS.

London County Council: The Housing Question in London. Being an Account of the Housing Work done by the Metropolitan Board of Works and the London County Council between the years 1855 *and* 1900, *with a Summary of the Acts of Parliament under which they have worked.* Prepared under the direction of C. J. Stewart, late Clerk of the Council. London: P. S. King and Son, Great Smith-street, S.W. 1900.

The Cottage Homes of England: The Case against the Housing System in Rural Districts. By W. Walter Crotch. Second edition. Price 2s. net. London: P. S. King and Son, Great Smith-street, S.W. 1901.

These two books deal with distinct phases of the "greatest social problem of the day." Mr. Stewart's report was published towards the close of last year, and will prove of immense value to all who desire to know what has really been done during the last fifty years to improve the artisans' dwellings of London. But it does more than give this information. The chapter on action taken by the Legislature gives in a concise form the chief features of all the Housing Acts, how they may be put in motion, and sets forth their weak and strong points. Aided by this summary, any one can obtain a really good idea of the extent of past legislation. Those responsible for the administration of affairs in districts other than the metropolis will see from the summary the sections applicable to their case, and may go at once to the fuller details in the particular Act they wish to adopt. Other chapters deal with the law on overcrowding and workmen's trains. The greater part of the book refers to works undertaken by the Metropolitan Board of Works and the London County Council. Full plans are given of every district dealt with. Mr. Stewart (who was assisted in compiling of the report by Messrs. W. J. Russell and M. H. Cox, LL.B. Lond.) has marshalled his facts with considerable skill. They are given in a way interesting to the general reader, but also sufficiently technical to be of real help to the administrative officers of Councils of all kinds. A number of valuable appendices are printed, which give the cost of various schemes, balance-sheets of dwellings erected by the County Council, and other useful information.

Mr. Crotch's book is of a more unpretentious character, but not the less valuable. It deals with the grave evils existing in rural districts, and urges the imperative necessity of a simpler procedure being adopted to cope with this complex question. We have no doubt that many of the uninitiated will be startled at the difficulties which beset the reformer at every point when he strives to get something better than a hovel for the farm labourer. Instead of Parliament helping, the whole aim of legislation seems to have been in the direction of "how not to do it." The account given by the author of various attempts made to put the Housing Act in motion is full of interest, but contains very little that will encourage others to try and grapple with the difficulty. Even when the preliminary conditions of the Housing Act have been complied with, there may be obstacles in the way of purchasing land, and this, as a last resource, has to be carried out under the Public Health Act of 1875. The following procedure will have to be gone through:—

(1) Advertisements and deposit of plan in November.
(2) Notices to and inquiries of all owners, lessees, reputed owners, &c., of land proposed to be taken.
(3) Petition by Council to Local Government Board, with detailed statements as to the land, &c., and such evidence as the Local Government Board may require.
(4) Local inquiry by Local Government Board.
(5) Notices of advertisements of proposed Order.

(6) Provisional Order by Local Government Board. (But this Order is of no force until it is confirmed by Act of Parliament. Sect. 297, 3.).

(7) If a petition is presented against the Bill, it may be referred to a Select Committee of the House of Commons, and the petitioner may appear and oppose as in the case of private Bills. Of course, again, the costs of an opposed petition are enormous, and it is very unusual to make a landowner opposing the taking of his land to pay.

(8) Ditto, ditto, in the House of Lords.

(9) Act of Parliament to confirm the Provisional Order of the Local Government Board.

By the time all this has been done, a pretty bill of costs will have accumulated, and the houses will be a dear luxury. The chapter on last year's Act adds considerably to the value of the book. It points out that the best feature of that Act is the one giving the Parish Council a court of appeal in the shape of the County Council. The book is well got up, and is worthy the attention of every true social reformer. It is well written, and free from the "padding" so often put into books of this description.

MUNICIPAL ENGINEERING & SURVEYING.

CROSS-TABLE CHAT.

Municipal and Sanitary Engineers will be interested in learning that a second edition of Colonel Moore's standard treatise on "Sanitary Engineering"—or, as it might perhaps be more fitly entitled, "Sanitary and Sewerage Engineering"—will be published on March 30th at the price of 32s. There is no book so reliable and so well up to date treating on sewage disposal in all its various and latest forms; of the design and construction of works of drainage and sewerage, of the disposal of house refuse, &c.; and hydraulic tables, formulæ, and memoranda, including an extensive series of tables of velocity and discharge of pipes and sewers as this, and I earnestly advise those who are practically engaged in sanitary and sewerage engineering to obtain the new edition for their library.

It is most infrequent to hear of a municipality which is enabled to obtain a good revenue from the sale of sewage sludge; but I am informed that the Corporation of the City of Glasgow are an exception to the rule. It is stated that chemically treated sludge (unpressed) is sold at 4s. and 5s. a ton, whilst pressed sludge is sold for as much as 20s. per ton. Glasgow "Bailies" are proverbially long-headed, and there was some surprise manifested by other journals as well as this when it was announced a short time ago that the Corporation were proposing to spend a large sum of money at their sewage outfall works for the chemical treatment of sewage. On the converse side it must be admitted that the farmers and others who buy the sludge at such fabulous prices are "puir bodies," who will sooner or later awaken to the fact that their estimate of the manurial value of the sludge is sadly out of proportion, and that as a matter of fact its monetary value is much less than that of an equal bulk of farm-yard manure. Most Local Authorities have found to their concern that whilst a demand for a period existed for pressed and dried sludge at a fair price, such demand ceased to exist altogether, and finally they were unable to dispose of it even as a free gift. I venture to predict that the Glasgow Corporation will be rudely awakened before long to the fact that their adherence to the "ancient" system of chemical precipitation and sludge manufacturing has led them into a useless and excessive waste of capital.

I venture to think that there are few engineers who have devoted more attention to the "Details of Drainage Construction" than Mr. Gerard J. G. Jensen, who recently read an excellent paper on the subject before the Society of Engineers, a report of which has appeared in our pages. Mr. Jensen is the author of "Modern Drainage Inspection and Sanitary Surveys," price 2s. 6d., and of "House Drainage and Sanitary Fitments," price 5s.—books which are in very considerable demand, and give the results of the experience of an engineer who is not only theoretically sound, but is also thoroughly practical; and I refer to his recent paper in this column in order that other engineers may have their attention more particularly directed to the important lessons which can be gained by a careful perusal of it.

Mr. Jensen suggests that in the construction of ventilation pipes to drains to avoid the loss of action due to bends, that the diameter of the pipes should be increased at the bend—a suggestion which appears to be entirely original. His experience with ventilating cowls is that such are of no practical value, and that a copper-wire guard for the terminal end of soil or ventilation pipes cannot be excelled.

The instance which was cited of cases of follicular tonsilitis—a disease always suggestive of defective drainage—periodically occurring in a large school, where the ventilation shafts in connection with the house drains terminated in close proximity to, and on a level with, dormitory windows, is one which is, unfortunately, all too common; and engineers and others who have to design or superintend the construction of drainage should insist on the outlets of such shafts being carried as far away from bedroom windows as possible.

Although there are, I know, some engineers who advocate, without reasonable grounds, the abolition of disconnecting traps, the illustration given in the discussion which followed of an epidemic of tonsilitis occurring in a large institution comprising numerous isolated blocks connected to the sewer by one main drain on which one disconnecting trap only was constructed, and all the drains freely ventilated, should be a warning as to the danger which is attendant upon their pushing their idea too far. It had been observed that in another similar institution with ward blocks arranged similarly to the former, but where the drainage of each block was disconnected from the rest by an intercepting chamber, no such disease manifested itself. The engineer, after full consideration, provided intercepting chambers to disconnect each block wherein disease had periodically occurred from the rest, and, as a result, its occurrence ceased.

I would draw the attention of my readers who are interested in the subject of model or industrial dwellings to an admirable paper on "Rowton Houses" by Mr. H. B. Measures, which was read before the Architectural Association on the 15th inst. The design and general execution of the work of these buildings is as nearly perfect as is humanly possible, and the author described these, and also the details of management in such a manner as cannot fail to be of especial interest to municipal engineers and sanitary officials, who will derive much benefit from a study of the paper. Senex.

At a meeting held in the Horniman Hall, Croydon, a resolution has been unanimously carried, appealing to Mr. Ritchie to use his influence to securing the full statutory period of sixty years for the repayment of building loans in connection with housing schemes undertaken by Local Authorities outside London, and to enable Local Authorities to borrow money at the standard rate of interest (2½ per cent.) from the Public Works Loan Commissioners for housing schemes.

NOTICES.

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The Sanitary Record

AND

Journal of Sanitary and Municipal Engineering.

MARCH 28, 1901.

PORT SANITATION.

SOME explanation of the comparative immunity of this country from plague and other contagious diseases of a deadly type is afforded by the annual reports of the various Medical Officers of the Port Sanitary Authorities, the most important of which have recently reached us. It reflects great credit upon the Port Sanitary Authority of the Port of London, and upon Dr. Collingridge's splendid administration, that the metropolis enjoyed during the whole of last year a remarkable immunity from contagion; but London does not stand alone in this respect. Special praise is due to the big sister Port of Liverpool, where Dr. E. W. Hope and his staff took precautions that deserve widespread publicity as being typical of what capacity and energy combined can effect on an emergency. Incidentally, the Liverpool Port Sanitary Authority is to be congratulated on the fact that its operations are greatly facilitated by the Mersey Docks and Harbour Board, which is fully alive to the exigencies of the situation. An arrangement is consequently in operation that no vessel coming from an infected port is allowed to enter a dock until she has been boarded by the Medical Officer of the Port Sanitary Authority and the captain has received a certificate from that officer. The active precautions against the incursion of plague merits special notice. Last year plague was diffused in a remarkable manner. Following the lines of seaborne commerce, it made its appearance in seaports thousands of miles apart, appearing in places so remote as Hong Kong, Bombay, Buenos Ayres, Sydney, and San Francisco. Under these circumstances, as Dr. Hope points out, it is no matter for surprise that cases should have been brought to the shores of this country, which possesses the largest mercantile marine in the world. Not only Liverpool, but London, Newcastle, Cardiff, King's Lynn, and Glasgow had isolated cases of disease brought to their ports, which there is no reason to doubt were cases of plague or convalescence from that disease. In Glasgow, despite its excellent sanitary equipment, the disease unfortunately found a foothold, and this, of course, necessitated a large addition to the port staff of Liverpool, so that the numerous vessels coming from Glasgow could be medically overhauled. To cope with this danger the staff of Inspectors was increased by seventeen, additional medical assistance was obtained, and the services of Dr. Balfour Stewart, an expert on plague, were secured. War was declared against rats; in fact, nothing was left undone that human ingenuity could devise to keep the dread disease at bay. From a public health point of view the circumstances attending these and similar precautions, and the successful manner in which the whole of the Port Authorities of the kingdom, without exception, rose to the occasion, should serve to reassure any whose minds are timorous in regard to contagion. The gratifying fact remains that the sanitary administration of the seaports was adequate to promptly suppress a form of disease, the appearance of which has always been associated in the public imagination with devastating consequences. This experience further serves to confirm the view that the appearance of plague in a seaport in this country must derive more importance from the commercial losses which it will entail, owing to foreign quarantine, than from any material influence which it is likely to have upon the public health, so long as rigorous measures are directed against it. No less energetic than the precautions against plague were those against small-pox, which was introduced on

eight occasions. The measures taken were somewhat drastic. For example, on the 30th of March the steamer New England arrived in the port flying the yellow flag, and was detained in the river until every person on board was re-vaccinated and disinfecting measures taken. Two lighters were interposed between the ship and the quay, so as to prevent communication except by the gangway. The quay was barricaded opposite the vessel. The shed opposite the vessel was cleared, closed, and all doors except one locked, and that one was watched by a person told off for the purpose, with orders to allow no one except the sanitary staff to pass, until the patients and their effects were removed. After the removal of the patients, access to the shed was allowed to the officers of the steamship company. Nineteen cases of small-pox and six suspected cases were removed to the hospital; and five attendants were removed for the purpose of vaccination and disinfection. All the other members of the crew and passengers were bathed, and changed into clothing which they alleged had not been used previously during the voyage. All articles of clothing, bedding, linen, curtains, cushions, &c., which had been in use during the voyage were removed from the vessel and disinfected by steam. The remainder were sulphured for twenty-four hours in the various compartments of the vessel. The disinfection of the articles taken away occupied five days.

From the foregoing, which we give as a typical instance, it will be seen the Port Sanitary Authorities of Great Britain can vie admirably with their inland brethren when there is hard work to be done. What Liverpool did was done, with modification, of course, in every instance. And the result we all know. In our opinion too little credit, by comparison, is given to this Department of Sanitary Administration. Be that as it may, one thing is certain—our Port Sanitary Authorities do their duty, and do it admirably.

Dr. Sykes at the Statistical Society.

Last week the well-known Medical Officer of Health of St. Pancras gave a most valuable paper on the housing question before the Royal Statistical Society. Dr. Sykes has spent a vast amount of time in obtaining the fullest information on what has been done, not only by the State, but by municipal and private means, to secure better houses for the working classes, and the paper gave the result of his extensive investigations. In summing up, he gave it as his opinion that in the hands of Municipal Authorities flats and blocks did not appear to pay so well as cottages, but in the hands of private companies they appeared to pay moderately. There was ample scope for individuals, private associations, and public bodies; and competition among them was benefical, provided it was upon a proper financial basis, and that bye-laws and regulations controlled all equally. Public Authorities must always be somewhat handicapped in competition on account of the publicity and routine involved in their transactions; on the other hand, they had the opportunity of evolving the best types of dwelling as standards of encouragement to private undertakings. If it could be made to pay, private enterprise would take the field; if not, not only would it be forsaken by individuals, but opinion would also prevent the action of Public Authorities, and an opening would hardly be left even for philanthropic efforts, since true philanthropy now-a-days had a financial basis for guidance. In the concluding portion of his paper, Dr. Sykes discussed the conditions that should govern future action. The remedy applied for overcrowded areas was clearance and reconstruction, but, owing to modern bye-laws and standards of building, fewer persons could be housed on the sites. Disappointment that the class displaced did not enter the new dwellings was only expressed by those unfamiliar with the movement of population produced by the clearance of an unhealthy area, but the mingling of the better with the worse thus caused must produce good educational effects since the worst houses were destroyed. How to deal with those who were determined, rather than were driven, to bury themselves in dark and unsalubrious places was more a social than a sanitary question, and depended more on education and supervision than on construction. Houses in a pressure zone were sub-divided more and more into smaller and smaller dwellings, and it was at this stage that arose the most serious point in the housing question—a point which had commanded very little of the attention it deserved. Some provision was urgently required to assist and stimulate both private and public owners to adapt houses to the requirements of separate dwellings. Mr. Cadbury's scheme, to which we directed attention last week, will do much to stimulate the building of such dwellings. The block system can only be defended under the most exceptional circumstances; and with the new powers given by last year's Act, it will be better to build cottages outside than these hideous structures inside our towns and cities.

An Indian Memorial.

In all parts of the British Empire proposals are being considered for the establishment of permanent memorials to the late beloved Queen. In most cases monuments or other combinations of masonry are proposed, but here and there the ideas take a wider scope, and schemes of usefulness have been suggested. One of the best of these comes from India, and takes the shape of a "model city," which shall possess every advantage for the promotion of health that modern sanitary science can provide. As we have said, the idea is a good one, but the means suggested by the originator for carrying it out are open to objection. He suggests "Victoria City" as the name, and goes on to propose that "the people might be located by selection in the city according to the lists furnished by all the subscribers of those they think the most worthy amongst the inhabitants of India. The city should be placed in some central district where there is a lot of culturable waste land, and

arrangements would be made for the allotment of this land, irrigated out of the general fund, at a fair rent to the inhabitants of the city, by lottery, and in such parcels as would be considered best for the general welfare of the people. Good roads, wells, and outlet drainage on the land would form part of the initial scheme. Given these, Victoria City would at once jump into prominence as one of the leading cities of India." India, we admit, greatly needs reform in the condition of many of its cities, but it had better wait than have them re-modelled by the aid of lotteries. The remedy is worse than the disease, and we sincerely hope that no memorial to Queen Victoria will be raised by such immoral and degrading means as here suggested.

Kimberley's New Medical Officer.

The diamond city of South Africa is to be congratulated upon securing so good a man as Medical Officer as Dr. Monk, who has just been appointed to the post. Although he has only been in Leicester about six years, he has proved a worthy successor of Dr. Priestley, who left Leicester for Lambeth. Perhaps there is no more difficult town in the country to administer than the centre of the shoe-making industry. It is the seat of a sturdy, independent people, who possess strong feelings and prejudices, more particularly upon the question of vaccination, and for any man to succeed amid such surroundings, stamps him as being possessed of much common sense and tact in dealing with difficult cases. We understand that Dr. Monk has for some time had very indifferent health, which fact was one of the reasons prompting his application for the post. Commenting on his removal from Leicester, a local paper expresses its regret at the loss the borough will sustain through his departure. That during the five years he has served the town as medical chief and adviser, "he has throughout discharged his duties with efficiency and energy all will agree. If, however, there is one great public improvement rather than another with which his name and fame must be associated, it is clearly the completion of the Isolation Hospital at Gilroes. It must be some satisfaction to the retiring officer that he has been enabled to remain long enough in Leicester to see this erected and opened. It need hardly be added that he will be followed to Kimberley by the best wishes for his health and progress in his professional career."

Progress at Stockton.

The enterprising Corporation of Stockton last week completed another instalment of its effort to make the borough one of the most progressive in the country. The old system of refuse disposal is to be abolished, and a Horsfall destructor has been erected at a cost of £3091. Under the old system some 17,300 tons were collected yearly. This was disposed of to farmers and others. In addition more than 1300 loads of trade refuse were collected. Night soil also had to be dealt with, and the difficulties of disposing of so much refuse have increased annually. After considerable consideration the Corporation has come to the conclusion that better means must be adopted, and the erection of a destructor will obviate a vast amount of labour. The plan to be adopted is based largely on the practice at Bradford, where the quantity of clinker and ash produced amounts to about 30 per cent. of the material treated. Our readers will recollect that at Bradford the whole of this percentage of ash and clinker is utilised, none having been taken to the tips for about four or five years. From 100 to 150 tons are used per week (or, say, two-thirds of the whole) for the manufacture of mortar, which finds a ready sale. What is not sold is passed through a breaking and grading machine and sold to contractors and others at 8d. per ton—lifted and removed by the purchaser. A substantial revenue of about £1000 a year is obtained from these sales. Stockton hopes to succeed in a proportionate manner, as well as effect a great saving in the cost of team and manual labour.

The Employment of School Children.

Public attention is being increasingly directed to the excessive employment of children of school age, to the detriment both of their health and of their education. The Home Secretary, in consultation with the Vice-President of the Board of Education, recently appointed a Committee, under the chairmanship of Mr. H. H. S. Cunynghame, C.B., to inquire into the whole subject, and to report what alterations are desirable in the laws relating to child labour and school attendance, and in the administration of those laws. The question has also been engaging the earnest attention of many School Boards and similar bodies. The School Board of Glasgow, for example, has received returns from the headmasters, which show that nearly 6 per cent. of the children attending school are employed for wages, and about half the number thus employed, or 2300, are under thirteen years of age, and in the lower standards. Nearly half the children thus employed are engaged in the delivery of milk and a considerable proportion are engaged in the delivery and sale of newspapers. The hours of employment vary considerably—from under ten hours a week of five days to between forty and forty-five hours a week. The average period of employment is about three hours a day, only a small proportion being employed for more than five hours a day. According to another set of returns procured by the Scottish Council for Women's Trades, covering 1592 school children in Edinburgh, it appears that 242 of them work for more than thirty hours per week, and a certain proportion forty-eight hours. One case was reported of a child of eleven working forty-nine hours a week, and another in which a boy of fourteen was employed from seven in the morning till midnight on Saturdays. These ascertained facts are probably but a gleaning on the surface of the state of things that must prevail all over the country. They indicate too plainly that the day of child slavery is not gone. It must, of

course, be admitted that it is a delicate matter to interfere with the parental control of a child—there is no province in which it is more difficult for the State to intervene—but Britain has a right to demand that the children who will one day be her citizens shall have a fair opportunity of full development without being cramped and starved n the springtime of life. Educational Authorities naturally look at the question from their own standpoint. They find that children who come to school weary with previous work are in no fit state to receive instruction. Our standpoint is the effect which this excessive employment, over and above the hours they spend in school, must have on the children's health and their physical development. A little time spent in the delivery of milk or such occupations may not only be not injurious, but even beneficial; but it is the *excessive* employment which we have a right to object to, and the undue strain placed upon the tender nature of a child, which is certain to impede its future development.

Meat Inspection in Glasgow.

Some months ago the question of the inspection of meat was raised in the Town Council of Glasgow by a complaint from a local firm of pork butchers and pig dealers, that, while swine purchased by them were, after slaughter in Moore-street Market, examined by the Inspector appointed by the Local Authority before being passed for sale, a large number of pigs belonging to other owners were slaughtered in private shambles in Ireland and elsewhere, which were not subject to inspection, and the carcases of which were distributed throughout the city without any examination. The matter was remitted to a Sub-committee, who have since reported, and the Committee on Health, by a large majority, now recommend that for the greater security of public health, and in addition to the detective system of meat inspections at present in operation in the city, the Corporation, in virtue of the powers conferred on them by Section 33 of the Glasgow Police (Amendment) Act, 1890, should make bye-laws for the inspection of carcases, meat, and flesh brought into the city, and for the treatment and disposal of such as are unsound, and that it be remitted (1) to the Sub-committee to frame such bye-laws for submission to the Corporation for adoption, and thereafter to the Secretary for Scotland for confirmation; and (2) to the Committee on Health to consider and report on providing suitable and convenient premises for such inspection.

The Small-pox Epidemic.

It is hard to carry conviction to the mind of anti-vaccinationists. Of all sceptics they seem to be the most difficult to teach. During the present epidemic of small-pox in Glasgow the health department have been most urgent in insisting that vaccination was the only sure safeguard, and in his last fortnightly report to the Town Council, Dr. Chalmers, the Medical Officer of Health, laid special emphasis on the point, for the benefit of those who are still doubtful. "In view of the efforts," he says, "which are being made to discountenance the value of re-vaccination, there is a present importance in the statement that no case of the disease has been admitted to hospital, and no person is known to the department to have sickened thereof, in whom re-vaccination has been performed before the disease was contracted. It is equally true that the performance of re-vaccination does not increase the severity of an attack in those who have contracted the disease before the operation, but whose sickness only begins within the next few days after its performance. On the contrary, it greatly modifies the attack." Even this emphatic and authoritative testimony was not, however, allowed to pass without question in the Town Council. One member disputed its value, and cited a case which, he held, disproved the generalisation. The Lord Provost, in reply, said that he was most thankful that Dr. Chalmers had made this statement. It was most important that it should be known that no one had required to be admitted to hospital who had been re-vaccinated for a longer period than fourteen days. In the case which had been instanced, the patient had been re-vaccinated only eight days before removal to hospital, which showed that he must have contracted the disease before re-vaccination.

Caretaking in Tenement Houses.

Another matter of considerable interest came up at the same meeting of the Town Council to which we have just referred, in connection with the "minutes" of the Health Committee. This was an amendment moved by Bailie Stevenson, "That with a view to compel the proper caretaking of tenement houses, without which the tenement system is incomplete, the Corporation be recommended to apply for parliamentary powers to transfer the responsibility for the keeping clean of closes, common stairs, and lobbies from the tenants to the landlords." Every student of Scottish history knew, he said, that we imported the tenement system from France, but in doing so we neglected to bring with it the caretaker. He instanced the work of Miss Octavia Hill in London, of the Edinburgh Social Union, and of the Glasgow Workmen's Dwellings Company, as showing how, with proper caretaking, slum properties could be kept cleanly. It is largely a question of administration. After discussion, a suggestion that that question be remitted to the Health Committee for consideration was accepted, and became the finding of the Corporation.

A Board of Trade inquiry was held at Horsham last Thursday in reference to the application for a Provisional Order on the part of the Horsham Gas Company. In making the application, the Hon. A. Lyttelton explained that it was one for a Provisional Order conferring further powers upon the Gas Company, with the object of maintaining and continuing several additional gasworks. It was, he said, really a Provisional Order for the authorisation of works rather than the acquisition of land.

TUBERCULOSIS—INFECTION, HEREDITY, PREVENTION, HYGIENIC TREATMENT.

By A. G. Young, M.D., Secretary State Board of Health, Maine, U.S.A.[1]

(*Concluded from page* 228).

Is the breath of the consumptive infectious?—Cornet in 1888, and, before him, various investigators, were apparently fully justified in their conclusion that the breath of the consumptive patient is free from infection. That was accepted as an established truth until the year 1897, when Professor Flügge[28] asserted that the most frequent media of infection are particles, or minute vesicles, of fresh sputum thrown into the air during the act of coughing.

He also declared that the opinion that the principal agent in the transmission of consumption is dried and pulverised tuberculous sputum does not rest upon experimental investigation which is not open to criticism. It has not really been shown, he says, that the inhalation of dried sputum by healthy persons can produce tuberculosis.

One of the pupils of Flügge, Dr. Laschtschenko, found that in experiments with fluid cultures of bacillus prodigiosus held in the mouth, this germ was diffused in the surrounding air considerable distances.

Neisser[29] and others, in subjecting animals to the inhalation of dried tuberculous sputum, have had many negative results, due apparently to the fact that their methods were faulty in differing widely from the usual conditions present in the accidental infection of human beings.

Sticher,[30] on the other hand, succeeded almost without exception in giving animals tuberculosis by rubbing perfectly dry tuberculous sputum upon a piece of cloth or board, and blowing it into the room where the animals were confined.

A year and a-half after the publication of his first paper Flügge[31] admitted that the infection of pulverised tuberculous sputum succeeds if certain conditions are observed. But he criticises the successful experiments as deviating too much from the conditions in dwelling-houses, where so strong currents of air are not present to send the dried sputum into the air, forgetting, apparently, the efficiency of certain prevailing household methods of raising a dust, particularly dry sweeping and dusting.

Heymann,[32] another pupil of Flügge, experimented with thirty-five consumptive patients by having them cough in the direction of glass slides. Tubercle bacilli were found on the slides placed before fourteen of these patients, 40 per cent. of them, at a distance of half a metre (nearly twenty inches).

Engelmann made similar experiments with eight patients, and found that tubercle bacilli were projected to a distance of one metre.

After the publication of Flügge's first paper on this subject, Dr. Wissemann[33] criticised it rather severely, and suggested as a crucial test the suspending of guinea pigs in cages near consumptive patients.

Heymann adopted the suggestion with precautions against the infection of the animals from infectious dust or otherwise than with the particles of sputum, sprayed from the patient's mouth in coughing. From six to ten animals were used at a time suspended in cages so constructed that the heads of the animals were constantly directed toward the coughing patient. The distance between the mouth of the coughing person and the animals' heads was only from twenty to forty-five centimetres (eight to eighteen inches). The animals were coughed at three hours every other day by "suitably chosen patients" (expert coughers probably) and the ordeal of each animal was extended from several weeks to several months. The result was that of twenty-five animals which had not succumbed to other causes, six showed symptoms of inhalation tuberculosis, but Flügge, referring to the results, remarks that the exceedingly slow course of the disease in these animals was surprising; and further he says that, in some of the animals, nothing was found but partially caseous bronchial glands, and that it was impossible to find the bacillus of tuberculosis in many of these glands. We may safely assume, therefore, that the dose of infection received by these animals was exceedingly small, in spite of their long and intimate exposure. Flügge thinks that there is, therefore, sufficient proof of the infectious capability of the particles of fresh sputum sprayed from the consumptive's mouth in the act of coughing.

Experiments made by Cornet[34] show that, in the act of coughing, the bacillus of tuberculosis is strewn only by patients in an advanced stage of consumption whose expectoration contains an abundance of bacilli, and who have a hard explosive cough. But it is only a minority of these patients who thus scatter infectious particles of sputum.

Dr. J. J. Curry,[35] of Boston, made some experiments with twelve consumptive patients in accordance with the suggestions of Flügge for further investigations. He found a comparatively small number of bacilli in the mouth fluid, but a much larger number in the larger drops of the sputum which came from the trachea in open-mouth, hard coughing. In experiments with glass plates suspended from one to three feet before the mouths of the patients, one-half of the patients gave negative results. "It is worthy of note that *all* these cases had a low cough and kept the lips closed during coughing. Of the others, six positive cases, every one had a loud cough and kept the mouth open while coughing."

To decide the question anew which Flügge had raised, Cornet instituted an experiment which should be as nearly as possible like those conditions under which infection is all the time going on in the houses of uncleanly consumptives who spit upon the floor. The sputum of a patient in an advanced stage of pulmonary tuberculosis was thrown upon the carpet of a good sized room. It was left to dry two days. Guinea pigs were placed in the room, some on the floor and others at various heights in the room. Then with a coarse broom the carpet was swept so as to put the infectious dust in motion. Of forty-eight animals thus treated, forty-six were infected.[36]

Dr Hermann Koeniger[37] has just published the results of his experiments at the Hygienic Institute of the University of Halle. They indicate that in ordinary breathing, no germs are thrown into the air, but that in loud speaking and in coughing they are. The enunciation of the vowels gave negative results, and the number of bacteria projected into the air depends upon the sharpness with which the consonants are uttered. In forceful speech or in coughing, the germs reach all parts of the room, laterally and at the rear of the speaker as well as in front of him; but the time during which they remained suspended in the air was surprisingly short, much shorter than was indicated by the experiments of Flügge. In ten minutes there was a diminution in the

[1] Reproduced, by special permission of the author, from the eleventh report of the Maine State Board of Health, U.S.A.

[28] "Deutsche Med. Woch.," xxiii., 665. 1897.
[29] "Zeit. für Hyg.," xxvii., 175. 1898.
[30] "Zeit. für Hyg.," xxx., 163. 1899.
[31] "Zeit. für Hyg.," xxx., 107. 1899.
[32] "Zeit. für Hyg.," xxx., 139. 1899.
[33] "Deutsche Med. Woch.," xxiii., 726. 1897.
[34] "Die Tuberculose," page 209. 1899
[35] "Boston Med. and Surg. Jr.," cxxxix., 368. 1898.
[36] "Revue de la Tuberculose," vi., 167. 1898.
[37] "Zeit. für Hygiene," xxxiv., 119. 1900

number of germs in the still air of rooms, and in one hour their complete absence was verified by many of the experiments.

SHIPLEY SEWAGE WORKS.

THE Shipley District Council, after four years of anxious labour, were last week able to put into full operation their extensive and important sewage works. There was a large attendance of representatives of various Authorities at the formal opening ceremony.

Mr. DUNN, who acted as chairman, said that that day was one of the most important days in the history of the Shipley Local Authority. The works that they were about to open formed the greatest undertaking that had ever been carried out in Shipley. They had expected to complete the scheme in two years, but it had taken them four. The Sanitary Committee had thought it only right that the chairman of the Council, who had taken great interest in the work, should have the honour of starting the pumps, and he would ask Mr. Paterson to present to Mr. Shaw a key with which to open the pump-house.

Mr. Paterson then presented to Mr. Shaw a gold key on behalf of the architects. The key was suitably inscribed, and was altogether a very handsome memento of an interesting occasion.

Mr. SHAW expressed his thanks for the beautiful present. He was very pleased, he said, to have the honour of opening the works. He recalled the fact that eight or nine years ago the Local Board had great difficulty in choosing a system. They were recommended to adopt the precipitation system; but after inspecting a variety of methods at different places, they resolved upon the bacteriological system. In their search for a site they went to view land at Esholt, but found there was not sufficient fall from some parts; but eventually they decided upon the 34½ acres at Dockfield. The works would cost them altogether something like £75,000. The destructor works had cost them also £4000. Mr. Shaw concluded by saying he was delighted to see so many visitors present.

Mr. Shaw then unlocked the door of the pump-house and set the pumps in motion. The gentlemen present afterwards inspected the various works; the destructor, which was in full working order; the bacteria beds, into which the sewage was flowing freely; and the engine houses. In 1893 the Shipley Local Board, as it then was, accepted the preliminary scheme of Mr. Malcolm Paterson for the works of sewage interception and treatment, and appointed him their engineer for the carrying out of the works. In September, 1894, the contract plans were adopted, to the total amount of £55,000. Owing to unusual pressure at the Local Government Office, and correspondence relating to the area of land to be devoted to the filtration of the tank effluent, sanction was not obtained until early in 1897, the first contracts being let in August of that year, for the whole of the intercepting sewers. Nine-tenths of the total flow of sewage is discharged into a storage tank sewer 8½ft. in diameter, and 792ft. long, holding 275,000 gallons, whence it is pumped about 47ft. into eight precipitating tanks, holding an aggregate volume of 1,000,000 gallons. Chemical treatment by lime and ferric-sulphate was at first proposed, as it was thought that trade effluents, including wool-washing and dye refuse, would be taken into the sewers, after preliminary treatment by the mill-owners. The tank effluent was then to be filtered through twelve acres of land. In 1898, however, the attention of the Council was drawn to the bacterial method of treating sewage, and ultimately they decided to put down bacterial filters to treat a dry-weather flow of 800,000 gallons per twenty-four hours, trade effluents being kept out. The series of "coarse" tanks have a bottom fall of 6in., and are filled to a mean depth of 3¼ft. with coarse clinkers. The fine tanks are filled to a like depth with the same material crushed and sifted. Thus taking the net working capacity in sewage volume as one-third of that of the empty filter, the capacity of each "fine" filter is 58,437 gallons, or a total of 233,748 gallons, and being filled three times daily the total volume which can be dealt with daily is 701,244 gallons. A supply conduit, 4ft. by 18in., extends along the head of the tier of tanks, and sewage is admitted to and discharged from each tank by four sluices. The effluent conduit extends along the foot of the tanks, and conveys the tank effluent to the land filter, wich will be about twelve acres in area, partly laid out on the pane and gutter system, and partly on the catchwater system. After filtration through the land the purified effluent is gathered into an open drain, with ledges 6in. wide, and samples can be taken to prove the efficiency or otherwise of every part of every bed, and also the discharging efficiency of each subsoil drain. The effluent drain discharges into the river Aire, which at this point is black and fœtid. To relieve the tanks and the land in time of heavy rain a storm-water conduit will take the sewage, after a dilution of two to one, from the settling tanks to a special filter of engine ashes, 2ft. thick, three acres in extent, with 4in. subsoil tile drains and 6in. seconds fire-clay pipes for drainage. The principle of discharging every drain into an open conduit is here also observed. The levelling of the three acres for the storm-water filter required the excavation of nearly 10,000 cubic yards of earth. The works are nearly finished, and it is believed that they constitute the largest installation of the bacterial system yet constructed in this country, and the Council express the hope that they will be able to demonstrate that this method of treatment can be adapted to the requirements of any community, however large, whose sewage is not sterilised by the admission of injurious trade effluents. The destructor, which is of large capacity, and has been in operation for several months, was constructed by Messrs. Meldrum Brothers, of Manchester.

Dinner was served in the evening at the Star and Garter Hotel, about fifty gentlemen being present.

FORTHCOMING MEETINGS.

MARCH.

Friday 29th.—The Sanitary Institute.—Lecture to Sanitary Officers at 7 p.m. Signs of Health and Disease in Animals destined for Food, when Alive and after Slaughter; Tuberculin and other Tests, by W. Hunting, F.R.C.V.S.

Friday 29th and Saturday 30th.—The Sanitary Institute.—Examination for Inspectors of Meat and other Foods, Birmingham.

Saturday 30th.—The Sanitary Institute.—Inspection and Demonstration at London County Council Sewage Disposal Works, Barking, at 3 p.m., conducted by Jno. Ed. Worth, M. Inst. C.E., District Engineer.

APRIL.

Monday 1st.—The Sanitary Institute.—Lecture to Sanitary Officers at 7 p.m. The Names and Situations of the Organs of the Body in Animals, by W. Hunting, F.R.C.V.S.

Wednesday 3rd.—The Sanitary Institute.—Lecture to Sanitary Officers at 7 p.m. Practical Methods of Stalling and Slaughtering Animals, by W. Hunting, F.R.C.V.S.

Thursday 4th.—Civil and Mechanical Engineers' Society.—Mr. A. Hanssen on "On the Proportions of Cylinders for Multiple-Expansion Engines." 8 p.m.

THE Madras Municipality derives a revenue of over Rs. 12,000 a year from its sewage farms, which comprise 58 acres.

Public Works.

SEWERAGE.

The Swansea Water and Sewers Committee has decided, with regard to the proposed sewage outlet at Brynhill, that the outlet near Vivian's stream be adopted. The estimated cost is about £60,000.

The Local Government Board has approved of the issue of a provisional order for the erection of sewage-disposal works at Drighlington, but has withheld its sanction to the application to borrow £12,660 for that purpose.

The Local Government Board has written the Lynton Town Council that the Board of Trade had sanctioned the scheme for extending the sewer outfall at Lynmouth as prepared by Mr. Chowins (Surveyor), and sanction for borrowing the necessary money has been given.

The Norwich Town Council has adopted the recommendations of the Sewerage and Irrigation Committee that the main sewage sewer on Dereham-road be extended from Bowthorpe-road to the junction of a new road with Dereham-road near the Lord Nelson public house, at an estimated cost of £70, that the main sewage and surface water sewers be constructed in Aylsham-road for the purpose of draining new building estates thereon from St. Augustine's Gates to the Windmill public-house, Aylsham-road, by men in the direct employ of the Corporation, at an estimated cost of £2867 12s. sewage sewer on Chapel Field-road to be extended into Coburg-street to drain Hudson's-buildings, at an estimated cost of £65, and that payment be made to Messrs. Sabberton Bros. of £34 13s. for engineer's work at the pumping station.

Last week at the Rochdale County Police-court the Urban District Council of Wardle was charged with knowingly permitting to flow into the Ash Brook liquid sewage matter. It was further charged with permitting to flow into the Higher Stock Brook liquid sewage matter. Mr. Wilson conducted the prosecution on behalf of the Mersey and Irwell Joint Committee. Mr. J. T. Worth, who defended the Council, said there was no doubt the Council had permitted an offence to be committed. It had already spent on its sewage works close upon £7000. They had met difficulties with the owners of property, who put their sewage into old stone drains and refused to connect them up with the sewers. The magistrates imposed a fine of £2 in each of the two cases, and made an order requiring the Council to abstain from polluting the brooks in the future.

A Local Government Board inquiry was held last week at Shenfield, concerning the application of the Billericay Rural District Council for permission to borrow £4900 for sewerage purposes for the parish of Hutton and for that part of Shenfield which is not included in the South Weald and Shenfield special drainage district. Mr. C. Edgar Lewis, Clerk to the Billericay Rural Council, said the population of Hutton was 458, and that of Shenfield 1160. The assessable value of Hutton was £3207, and that of Shenfield £6916. The outstanding loans were: Hutton, £941; and Shenfield, £4878. The loan was required for the Shenfield and Hutton joint drainage scheme and the Shenfield Common sewer extension scheme. The latter would amount to £2800, and would be a charge on Shenfield only. It was the intention of the District Council to abate a nuisance which had existed for a considerable time. At present the sewage ran down an open ditch, and was a source of great danger to health. It was proposed to lay and connect a sewer with the Shenfield and Hutton system at the corner of Priest-lane, and the sewage would be treated at the Shenfield outfall works. Mr. Bailey Denton, engineer, explained the scheme in detail and submitted plans.

A Local Government Board inquiry has been held at Leicester with reference to the application for sanction to borrow £2570 for works of sewerage in Hinckley-road and Palmer-street, Belgrave. The application was not opposed.

A report has been submitted by the North Ayrshire District Committee with regard to the new drainage scheme for Dreghorn, in which it has been agreed that the scheme advised by Mr. Copeland, C.E., be recommended for adoption at an estimated cost of £3600, including cost of disposal works.

Colonel W. R. Slacke, R.E., conducted an inquiry at Colne last week into an application by the Corporation for leave to borrow £11,161 for sewage disposal purposes, including the construction of works on the boundary of Trawden. There was no opposition. The Town Clerk (Mr. A. Varley) said the present flow of sewage was 563,496 gallons per day, and it was proposed to provide for a two days' flow.

At the last monthly meeting of the Doncaster Rural Council it was resolved that the Council join the West Riding District Councils Association. The Clerk's estimate of a rate of 1d. in the pound for sanitary work and 4d. in the pound for highway expenses was approved, and the Clerk was authorised to apply to the Local Government Board for sanction to borrow £11,725 for the Conisborough and Denaby sewage scheme, and for £2960 for the Thurnscoe sewage scheme.

At a meeting of the Philosophical Society of Glasgow last week, Professor Glaister read a paper on "Sewage Disposal and Sewage Purification." The various modes of disposing of sewage without purification were described, and special attention was paid to the enlarged Glasgow scheme. When the new sewage scheme is inaugurated at the works at Dalmarnock, Braehead, and Dalmuir, the total daily quantity of sewage to be dealt with will vary from one hundred to two hundred million gallons, the amount depending on the state of the weather. From the results of experience at Dalmarnock it is estimated that the annual amount of sludge to be treated will be between a million and a million and a-quarter tons of wet sludge, and from one hundred to a hundred and twenty thousand tons of pressed sludge. This problem, he continued, is too important for the citizens to avoid taking an interest in, and he hoped that some official pronouncement would be made regarding what the Corporation intend doing in the matter, so that it may be subjected to intelligent criticism before final adoption.

Up to the present time the sewage from the parishes of Winshill and Stapenhill, in the Burton borough, has been turned into the river Trent untreated. These two places have a population of about 10,300, and the number of inhabited houses is estimated at 2000. There has for some time been public protest against this mode of sewage disposal, and at its meeting last week the Burton Town Council had under consideration an important report from the Highways and Sewers Committee recommending the adoption of a complete system of sewerage for the two places named, prepared by the Borough Surveyor, Mr. Lyham, and estimated to cost £47,500. The plan and report embrace a main intercepting and outfall sewer, estimated to cost £16,582; intercepting and branch sewers, £21,696; ventilation, £1774; easements, contingencies, and engineering expenses, £7448. The Committee recommended that the report and plan should be adopted, and that the Surveyor should prepare the necessary plans, sections, and estimates for obtaining the sanction of the Local Government Board to the borrowing of the necessary money; and, further, that the Highways and Sewers Committee should be authorised and directed to carry out the scheme in the name of the Council.

Some little difficulty is being experienced in connection with the southern or Fulshaw scheme of sewerage, for which several thousand pounds has been borrowed by the Wilmslow District Council. A sewer has been laid at a great depth in Sandycroft-road, which connects the Gravel-lane scheme with the new sewer now being constructed through Fulshaw Park, an important residential part of the Wilmslow district. The cutting in Sandycroft-road is causing no little trouble and expense. Certain house property on one side of the road belonging to a Mrs. Royle has already had to be taken down, and a heavy claim has been sent in to the District Council. It is feared, however, that further claims will be sent in to the Local Authority. The Fulshaw Park scheme has yet to be completed, and then Harden Park, where a number of large mansions are situated, will be taken in hand, which will necessitate the breaking up of a long length of the Wilmslow and Alderley Edge main highway. Nearly £30,000 has already been borrowed for sewerage works in the Wilmslow and Fulshaw districts.

WATER.

The Ilkeston Town Council has decided to promote a Bill in Parliament for the provision of a water supply for Ilkeston and Heanor. The scheme is to cost £128,000.

A Local Government Board inquiry has been held at Ryde by Mr. A. A. G. Malet, A.M.I.C.E., into the application of the Corporation for sanction to borrow £1550 for works of water supply.

Colonel Slacke, R.E., held an inquiry at Towcester last week with reference to an application by the Rural District Council for sanction to borrow £1400 for works of water supply for the parish of Towcester.

A special meeting of the Llanelly Urban Council was held last week, for the purpose of sealing the receipt for an order of payment of £5000, being the fourth instalment from the Public Works Loan Commissioners on account of £39,500 required for the new reservoir.

It was reported at a recent meeting of the Heckmondwike District Council that the profits of the united Waterworks Board (Dewsbury and Heckmondwike) for the past year had been £5000, £1250 of which was Heckmondwike's share, or £300 more than last year.

An immediate start is to be made at Andrew with the work of laying the new water main from the waterworks to the town. The contractors (Messrs. Mitchell and Sons, Dundee) were in the town last week and made arrangements for the work being begun. It is expected that the laying of the main will occupy a couple of months, after which the augmented supply of water will be available.

At a recent meeting of the Kintore Town Council the principal business was the consideration of a report from Dr. Watt, Medical Officer of Health for the Burgh, recommending the immediate introducion of a new water supply. After some discussion, the matter was remitted to a special committee, consisting of Provost Marshall, and Councillors Smith and Lindsey, to go into the whole matter, to examine the proposed source of supply, and report when steps would be taken to meet Dr. Watt's recommendations.

A Local Government Board inquiry was held at Clifton last Friday with reference to the application of the Halifax Rural District Council to borrow £6350 for the purchase of the Clifton Water Supply Company, Limited, which supplies the villages of Clifton and Hartshead with water. It was stated that the company got its water from the Halifax Corporation on advantageous terms, and that the price to be paid by the Council for the undertaking had been mutually agreed upon.

The London County Council Water Bill came before the House of Commons on Tuesday, when the second reading was rejected by a majority of 77. The Government promises a measure next year.

A special meeting of the Yeovil Rural District Council was held recently for the purpose of executing the deed of mortgage by the Council to the Public Works Loan Commissioners of the rates of the parish of Montacute, to secure £1300 and interest, the loan being for purposes of water supply for Montacute.

Mr. M. K. North, C.E., an Inspector of the Local Government Board, visited Newbiggin last week and examined the existing sources of water supply, and also viewed the route of the water mains proposed for the new water supply for the town, which the Council has adopted, as designed by Messrs. D. Balfour and Son, civil engineers, including the source of supply, with site of additional storage accommodation.

After a hearing of nearly three hours before a Committee of the House of Lords last week, a partial compromise was effected on the Bill promoted by the Prestatyn Urban District Council with the object of compulsorily acquiring the water undertaking of the town and neighbourhood, and it is expected that an agreement will be arrived at in regard to the other points in dispute. Finally an adjournment was taken to give the promoters an opportunity of seeing whether an agreement could be reached with Lord Windsor and the other petitioners in respect of compensation water.

The Hartlepools Gas and Water Transfer Bill has come before the Court of Reference on *locus standi* in the House of Commons, the petition objected to being to the Sunderland and South Shields Water Company. Mr. Lloyd, who appeared for the Sunderland and South Shields Water Company, argued that they had a right to appear when the Bill came before the Committee, as there were clauses in which it would enable the promoters to supply his district. Mr. Fitzgerald, for the Bill, expressed his willingness to alter the wording of one of the clauses, the effect of which would be to require the consent of the Sunderland and South Shields Company before going into their district. The *locus standi* of the petitioners was disallowed.

Last week the Salford Corporation Water Bill was before a Committee of the House of Lords, presided over by Lord Newton. The measure is one to enable the Salford Corporation to procure from the Corporation of Manchester a daily supply of water beyond the 2,000,000 gallons which they are now entitled to receive in bulk, and for which a price of 3d. per 1000 gallons is charged under the statute. The conditions on which the Bill suggests that this extra supply shall be obtained are that three months' notice shall be given, the notice to state the point of delivery and the pressure required, the quality of the water to be the same as that supplied to the city of Manchester. If the Manchester Corporation is dissatisfied with the price named, the matter is to be settled by arbitration.

Dr. Best gave an instructive address at the Liberal Club, Louth, last week, on the question of the purchase of the Louth Waterworks by the Corporation. His argument was that the present worth of the waterworks undertaking was about £9000, and yet the Highways Committee of the Corporation had unanimously recommended its purchase at £15,000, and this recommendation had only been defeated in the Council by a majority of one. He showed that at the present time only one-third of the people of Louth were using the water, and he argued that it would be quite unfair and most unjust for the other two-thirds to be compelled to pay their share of the cost for the benefit of the other third. He also showed that the income of the company was ridiculously small, and that its £10 shares in the open market realised under £5. The original cost of the undertaking was about £20,000.

LIGHTING.

The electric lighting mains are now being laid in the streets of Maidstone.

A Board of Trade inquiry has been held at Pinner, with reference to the application of the Pinner Gas Company asking for additional powers for extending their works and for further capital.

At a meeting of the Treasurer's Committee of the Edinburgh Town Council last week, a deputation was received from the Edinburgh and Leith Gas Commissioners, who requested a loan of £200,000 from the city funds. It was agreed to give the loan at 3¼ per cent. for forty years.

The Wirksworth Gas Company's report states that the directors propose to declare a dividend of 8 per cent. for the past year, and place £50 to the reserve fund account. The surplus amounts to £453 5s. 4d. On the net revenue account the directors paid a dividend at the rate of 3½ per cent. on April 5th, absorbing £175.

It appearing from the report of the directors of the Northfleet and Greenhithe Gas Company for the half-year ended December 31st last that it was not anticipated that the late high price for coal would be maintained, the Clerk of the Council has been directed to write the company asking that the price of gas to the public lamps and public offices should be reduced to the price it stood at before the last increase after the end of this month.

The Select Committee of the House of Commons resumed on Friday the consideration of the Heckmondwike Gas Bill, the object of which is to establish a Joint Gas Board for the two districts of Liversedge and Heckmondwike, and to transfer to this Board the undertaking of the Heckmondwike Gas Company. Further evidence was now called in support of the promoters' case. The Committee finally found the preamble not proved, and that the promoters had not proved their case.

If the Local Authorities on the north of the Thames are not very much alive, there is a prospect of the ratepayers having to pay a considerably increased price for gas to street lamps. The Gas Light and Coke Company, at the present time, are bound to supply the public lamps on this side of the river at the same price as charged by the South Metropolitan Company, which is now 2s. 8d. per thousand feet. This is 9d. per thousand less than the Gas Light and Coke Company are charging to private consumers. If the Bill which is being promoted by the company, to transfer their undertaking on the south of the Thames to the South Metropolitan Company, is passed, they will be released from this obligation. The cost of public lighting would be considerably increased if the same price as charged to private consumers, 3s. 5d. per thousand feet, were made.

A special meeting of the Sheffield Chamber of Commerce has had the Yorkshire Electric Power Bill under consideration. After hearing a deputation from the promoters, more particularly with reference to a new clause relating to the supply of energy, the following resolution was passed:—"That this Chamber, having considered the Bill of the Electric Power (Yorkshire) Company, and having regard to the fact that the rights of the Sheffield Corporation have been provided for and saved under the new 40th Clause of the Bill, do hereby declare that in their opinion the company's Bill is concerned in the best interests of the commerce and industry of this locality, and that it must be a great advantage to traders generally that central power stations should be established for the generation and distribution of electric power for motive and general manufacturing purposes at the lowest possible cost. The Chamber is prepared to support this principle by evidence before the Parliamentary Committee which will consider the Bill, if this be deemed necessary."

The Local Government Board has written the Newtownards District Council that it has recommended to the Board of Works loans of £3250 for gasworks extension and £160 for market improvements.

The Poulton-le-Fylde Gas Bill came before Lord Newton's Committee of the House of Lords last week. It provided for the purchase under certain conditions by the Urban Council of the gasworks of the Poulton-le-Fylde Gas Company, and for the Council to supply the district with gas. The gas company originally petitioned, but when the Bill was called it was stated that the parties had agreed, and the Bill was accordingly sent to Lord Morley as an unopposed measure.

The Board of Trade inquiry into the electric lighting regulations reached its final stage on Friday, when Sir Courtenay Boyle again attended at the Westminster Town Hall to hear speeches of counsel. Mr. Glen, speaking for the Paddington Borough Council, replied to Mr. Balfour Browne's contention that the change was indirectly for the benefit of the consumer. If that were so, the persons who would derive most benefit would be those whose installation did not require alteration. Why should not those people whose installations did require alteration benefit to the same extent as the others? They would not do so even indirectly, unless they were placed in the same position as if their installations had been the same as the others in the first instance. It was admitted by Professor Kennedy that there would be no difference in the light from the change, and that it was possible the 100-volt lamp was more economical. If that were the case, surely it must be to the detriment of the consumer to force him to use in all cases the 200-volt lamps. As to Professor Kennedy's tests, they were made upon lamps which were sent to him at his own request, and were naturally selected as the very best lamps obtainable. Mr. Danckwerts, for the City of London Corporation, said that it was true that a perfect installation for 100-volt lamps would answer in the case of a 200-volt lamp installation, but he submitted that men of business must know, from their experience of the British workman, that the probability was that a perfect installation did not exist, except, perhaps, where the arrangements had been carried out by the engineer himself. The Board of Trade was asked to deprive people of a vested right. Wherever a vested right was proposed to be taken away it was a root principle in this country that it must be shown that a public benefit, and not a mere private benefit, would result. Tested by that principle, the proposal must fail, and he submitted no case had been made out at all by the electric lighting companies.

GENERAL.

The Whitehaven Town Council is about to purchase and repair the baths and wash-houses in that town.

Mr. A. A. G. Malet, a Local Government Board Inspector, held an inquiry at Kingswood last week, respecting the application of the Urban Council to borrow £2000 for street improvements.

On Wednesday in last week Mr. E. A. Sandford Fawcett held an inquiry on behalf of the Local Government Board at Tunbridge Wells, with reference to an application by the Town Council for two loans, namely, £1800 for street improvement and £10,000 for establishing a municipal telephone system for the borough of Tunbridge Wells.

In the picturesque village of Allesley, Warwickshire, an ancient custom which is found to linger here and there, is still observed. The church bell is rung at five o'clock every morning in the summer, and at six o'clock in the winter, in order to arouse sleeping villagers, and enable them to start work in good time. The curfew bell is also tolled at eight o'clock each evening.

We understand that the Urban District Council of Farnworth has some large schemes under consideration. It is proposed to spend £40,000 in street works and improvements, £14,000 in the erection of public buildings, and £5000 in works of sewerage and sewage disposal.

With reference to the case of plague reported at Southampton, says the *Times*, the utmost precautions have been taken to prevent the possibility of its spreading. Dr. Reece, of the Local Government Board, has been in consultation with the Local Authorities with this end in view. It appears that the affected lascar was a steward in the Simla, and was taken ill shortly after the vessel left Cape Town. The Simla called at Plymouth before proceeding to Southampton, and was there given a clean bill of health; in consequence she came direct into dock. Had she not called at Plymouth she would have anchored off Netley until boarded and passed by the Port Medical Officer, plague regulations having for some time been in force at Southampton. It is expected that the outbreak will not interfere with the transport arrangements save in respect to the Simla herself. Dr. Reece also visited Plymouth on Friday last, and he has been satisfied that no blame attaches to the Medical Officer of that port for not diagnosing the case as one of plague. As a matter of fact, no report of the illness of the patient was made at Plymouth, nor, indeed, until two days after the ship's arrival, at Southampton.

The public inquiry into the application of the Leeds Corporation for the issue of a Provisional Order confirming an improvement scheme under the Housing of the Working Classes Act, 1890, by which it is proposed to deal with the Quarry Hill insanitary area, was resumed before Mr. R. H. Bicknell, M. Inst. C.E., an Inspector of the Local Government Board, at the Leeds Town Hall, last Friday. Mr. Jeeves, the Town Clerk, in concluding his speech, submitted that the Corporation was not acting improperly; but, on the other hand, was acting most properly, in the discharge of a duty, the importance of which must be increased and added to every day. There was, perhaps, no more crying question at the present day than that of dealing with unhealthy houses and the housing of the working classes generally, and if the Corporation did not take the matter up, it would not be fulfilling its public duty. It was no pleasure to the Corporation to carry out such schemes, because they involved an increase of the rates. He left the matter with all confidence in the hands of the Inspector, believing that he would deal with it in the broad light of the Act, and not in the light of the narrow interests of individual pockets.

The new refuse destructor at Greenbank, erected by the Blackburn Corporation in order to cope with the heavy quantity of refuse which is daily taken off the streets, has been working successfully now for several weeks, and recently the members of the Sewage Committee inspected the works. In Blackburn 1000 tons of refuse per week are dealt with, and of this amount 400 tons is disposed of at the Audley destructor and 40 tons at the Storeyard destructor. Great difficulty was experienced by the Corporation in obtaining suitable sites for tipping the surplus refuse, both within and without the borough very strong objections being raised on account of the offensive smell given off, and also of the unsightly nature of the refuse. To meet this difficulty, on the recommendation of the Borough Engineer, the Committee decided to erect another destructor on a plot of land adjoining the new gasworks at Greenbank, and to generate the steam necessary for driving the engine and other plant required in the manufacture of gas. The works have so far given every evidence of being able to do the work which was guaranteed by the contractors. The cost of the land, buildings, machinery, &c., has been £9000.

The Devon County Council has adopted a recommendation of the Finance Committee to lend the Newton Abbot Hospital Committee a sum of £6100, the estimated cost of providing a joint isolation hospital, according to plans sanctioned by the Local Government Board.

A recommendation to the Liverpool City Council has been adopted by the Health Committee of the Corporation to the effect that 100 guineas be granted towards the expenses of the International Congress on Tuberculosis which is to be held in London in July next. The hon. secretary of the Liverpool branch of the Congress is Dr. Nathan Raw, of Mill-road Infirmary.

The Sanitary Commissioner with the Government of India draws attention, in his last report, to the significant fact that, although *beri-beri* disease has long existed in Burma, and occurs in certain districts of Madras, no case of it has ever been recorded in the wheat-eating areas of India. In Rangoon, Hindoo natives of India appear to suffer most. Those attacked belong almost entirely to the coolie class, chiefly from Southern India, and are generally people whose diet, though it may be plentiful, is very deficient in nitrogenous elements. In the past three years close on a thousand cases of *beri-beri* have been admitted into the Rangoon hospital, very little more than half of them recovering. The death-rate, indeed, is returned as 48 per cent. of the 944 cases registered. This means more than 400 deaths.

Dealing with the old sore of insanitation, Dr. Palmer says there is nothing of the nature of "the housing problem" in Newtown, but that the rate of mortality is materially influenced by the density of population in courts and alleys, a real sense of which he strives to instil into the mind of the Sanitary Authority. Yet a close examination of the Doctor's report, remarks the local paper, would indicate that the housing question in Newtown is every bit as serious as that of Welshpool, for he observes, "the urban portion of the district is honeycombed with courts and alleys, and I believe the inhabitants of these unhealthy places would be glad to come out into the open if suitable accommodation were provided." The character of these unwholesome holes may be imagined when, from a sanitary point of view, the Doctor contends they can only be effectively dealt with by dynamite. It is satisfactory to learn that the notorious "Lot" has been improved "beyond recognition," but the "exasperating slowness" which attends the improvement of other slums should sharpen the determination of the Sanitary Committee to thoroughly accomplish the important work upon which they are engaged.

The disposal of town refuse in South Shields has long been a matter which has given rise to a serious consideration in the South Shields Corporation. The present system consists of the removal of refuse to the staith on the riverside, from whence it is taken to sea, and the supplying of farmers and others inland with quantities. With respect to the latter method an increasing difficulty has been experienced in getting rid of the refuse, and the establishment of depôts in the town has also been most unsatisfactory. Lately the question has reached an acute stage, and at a meeting of the Health Committee last week a decisive step was taken. The Committee, after some discussion, resolved to recommend the Council to adopt the principle of a refuse destructor, and their recommendation will come before the next ordinary meeting of the Council. It is in every way probable that in order to obtain some idea of the working of these destructors a deputation may visit Glasgow, Leeds, and other places. It is suggested that the destructor should be established on a site in the neighbourhood of the Deans. The cost of the provision of such a destructor would be anything from £18,000 to £20,000, though until the details are known the exact amount cannot be definitely estimated.

Colonel C. H. Luard, R.E., held an inquiry at Nottingham recently with reference to the applications of the City Council to borrow £24,000 for purposes of street improvement in Parliament-street, Nottingham, and £10,000 for the reconstruction of the Carrington-street Bridge.

PERSONAL.

Dr. Logan and Dr. Joyce have been reappointed Medical Officers for Ashley.

Mr. E. Brooke, of Brighouse, Yorks, has been appointed City Surveyor for Lichfield.

Dr. Fox has been reappointed Medical Officer for Walsall, and Mr. Jackson as Inspector.

Dr. Elliott has been reappointed Medical Officer of Health for the rural district of Oundle.

Dr. Thresh has been appointed Medical Officer of the Chelmsford Rural District Council's isolation hospital.

Dr. Smithies has been reappointed Medical Officer of the Gisburn district of Clitheroe for twelve months.

Mr. H. J. Norris has been reappointed Inspector of Nuisances for Herne Bay, at a salary of £120 per annum.

Dr. Behrendt has been reappointed Medical Officer for the urban district of Scunthorpe, at a salary of £45 per annum.

Mr. John Barritt has been reappointed Inspector of Nuisances for Kettering, at the increased salary of £130 per annum.

Dr. J. A. Goodall and Mr. Margereson have been reappointed Medical Officer of Health and Surveyor respectively for Brampton.

Mr. Thomas H. Scott, C.E., Edinburgh, who belongs to Selkirk, has been appointed Burgh Surveyor and Sanitary Inspector of Peterhead.

Mr. G. F. Beecher has been appointed Medical Officer for the south-east district of the Sheffield union, in room of Dr. E. W. Adams resigned.

Dr. William Sedgwick Saunders, Medical Officer of Health for the City of London, who died on January 18th last, left personal estate of the net value of £36,836, and the whole of his estate has been valued at £38,170.

LAW CASES.

A Sanitary Inspector's Appeal.

The High Court of Justiciary at Edinburgh disposed last week of an appeal taken by John Frew, Sanitary Inspector for the county of Linlithgow, against the decision of Sheriff-Substitute Macleod, acquitting Thomas Gunning, dairyman, Kirkliston, of a charge of contravening the Food and Drugs Act. The complaint was that the respondent on 5th December, 1900, on the public road in Kirkliston, sold to the appellant two pence worth of sweet milk, which was not of the nature, substance, and quality demanded, in respect that it contained 13 per cent. or thereby of added water. It was proved that when the Inspector asked for the milk the respondent was about to supply him out of a can which contained the produce of his own cows, but the Inspector refused to have it, and desired to be supplied out of a large barrel. Before supplying him the respondent informed the Inspector that the milk in the large barrel had been purchased by him, and that it might or might not prove to be sweet milk. On these facts the Sheriff decided that, as the appellant had been supplied with the article which he insisted on getting after warning, the respondent was entitled to an aquittal. The Sanitary Inspector appealed, but the High Court confirmed the decision, and dismissed the appeal, with seven guineas of expenses.

Vitiated Air in Workrooms.

With the approval of the Home-office, Miss Lucy A. Deane, one of his Majesty's Inspectors of Factories, summoned to Westminster Police-court Mr. Hulbert Beach, court dressmaker, Sloane-street, under Section 32 of the Factory Act of 1895, for failing to take adequate measures for securing and maintaining a reasonable temperature in his workrooms, where many young women are employed.

Miss Deane said this was a very important prosecution, the first of its kind—which affected the comfort and health of many work-girls. It was not a question of working in excessive cold or heat, but of the way in which the temperature in winter of workrooms was maintained—viz., by shutting doors and windows, so that the heat generated from the bodies of the workers and from gas jets warmed the place. Anything more foul and unwholesome could not be imagined—such workshops became perfect hotbeds of consumption and other diseases.

Mr. Sheil said the section of the Act did not refer to ventilation but to temperature.

Miss Deane: There is no other section by which we can meet cases like this.

Mr. Sheil said he thought it was a shocking state of affairs as described by the Inspector, but he could not strain the law. The Legislature should alter it.

Miss Deane contended that the very narrowest interpretation should not be placed on the section. Would his Worship hold that "a reasonable temperature" would be maintained, say from the poisonous fumes of a charcoal brazier? Surely it was a case for a broad view.

Mr. Sheil: I beg your pardon. This is a criminal case, and I must construe it strictly.

Miss Deane: May I suggest that this section was drawn to meet an almost illimitable field of contingencies?

Mr. Sheil: You cannot speculate about that. If Parliament does not provide against workers being poisoned and asphyxiated with foul air, I can't help it.

Miss Deane said she had instructions to ask for a case, and therefore she wished to be sworn. In evidence she stated that she visited two dressmaking and tailoring workrooms on the defendant's premises, where "the heating apparatus" on a winter day consisted respectively of fourteen and eleven young women and numerous gas jets. The windows, &c., were tightly closed and the fire-grates removed. The air was vitiated and extremely foul.

Dr. Louis Parkes, Medical Officer of Health for Chelsea, said that girls working in such unhealthy conditions must be seriously affected. The defendant denied cases of illness, or that the workshops were unhealthy.

Mr. Sheil said he regretted to be obliged to dismiss the summons. He considered that such an abominably unwholesome state of things should be remedied.

Miss Deane reiterated her request for a case.

Mr. Sheil: Yes; but you had better get the opinion of the law officers before you go on.

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2129.—Landlord and Tenant: Insanitary Dwelling-house.—"H. V. P." writes:—"I have recently taken a house, and find the following irregularities in the sanitary arrangements: (1) Inside water-closet has a very old pan, water-closet which after being used and flushed becomes quite dry, consequently there is always a stench arising therefrom. (2) Two outside water-closets also very old pans, and I am unable to flush these at all. (3) Two rain-water cisterns in a very dirty state. (4) Main cistern (outside, but well covered) in a very dirty state. (5) There is no dustbin of any kind. (6) The kitchen range is quite useless. Will you please advise whether I can compel the landlord to make good the before-mentioned defects, or whether the matter rests with me as tenant? I have not the house on a repairing lease."

Answer.—In the absence of express stipulation a landlord is at common law, not compellable to do any repairs whatever to an occupied dwelling-house. He may, however, if he chooses, take upon himself to do all or any of the repairs during the term of tenancy. A tenant should ensure before entering into occupation of a dwelling that it is reasonably fit for human habitation, and if the landlord fraudulently represents that it is fit for human habitation when such is not the case, and injury to health is caused to the tenant or any members of his family by defective drains, dampness, or vermin, an action will lie at the suit of the tenant against the landlord. With respect to the insanitary and other defective conditions described by the querist, he should give the landlord the opportunity of doing the work, and after reasonable notice, if such work be not carried out, then he should write to the Inspector of Nuisances of the Local Sanitary Authority whose duty it will be to visit the premises; and if he finds that any nuisance exists owing to structural defects, such as those mentioned, he must make a report to the Sanitary Authority, who may serve notice upon the owner to carry out such work as they may direct to abate the nuisance.

2130.—Isolation Hospital: Sewage Disposal Scheme.—"M. O. H." writes:—"Could you please suggest the best method of treating the sewage from a small isolation hospital of ten beds, where sewers are not available?"

Answer.—Either the septic tank system, or the "Dibdin," or Sutton system, can be safely recommended. The querist is advised to read Martin's "Purification of Sewage by Bacteria," price 6½d., post free; and Dibdin's "Purification of Sewage and Water," price 21s.; or Thudichum's "Bacterial Treatment of Sewage," price 1s. 3d., for further information on the subject. Any of the books may be obtained from the office of this journal.

2131.—Combined Drainage: Drain or Sewer.—"X. Y. Z." writes:—"In a terrace of nine houses the first house belongs to Jones and the remainder to Brown. All the nine houses drain into one common drain at the back, and before joining the public sewer in the main street they unite in a private passage-way with the drain from the six houses belonging to Robinson. I contend that the drain crossing the gardens of Nos. 2 to 9 is a portion of a single private drain. The Public Health Acts Amendment Act, 1890, is in force, and action is being taken under Sec. 41 of the Act of 1875. Do you think my contention is correct?"

Answer.—We have considerable doubts as to whether the combined drain receiving the drainage of the eight houses belonging to Brown can be deemed to be a private drain. The house No. 1 belonging to Jones is not connected to the common drain constructed by Brown, and therefore Sec. 19 of the Act of 1890 does not appear to apply. The houses are not within the same curtilage. We think the better opinion to be that the common drain is a sewer, and vested in the Local Authority.

2132.—Combined Drainage, Drain, or Sewer.—"J. S." writes: "I enclose plan showing a block of houses drained by a combined drain, and shall be obliged for your opinion as to whether the drain is a drain or a sewer?"

Answer.—The drain is a single private drain and not a sewer. The houses connected to the drain are within the same curtilage, and the owner is liable for the repair of the drain.

2133.—Privy System: Cleansing of Privies.—"H. C." writes:—"In our district the privy cesspool system is in use. The ashes are kept entirely separate. We experience much difficulty at times in cleansing the privies owing to children casting tin cans, brickbats, and any useless rubbish into them. Have we any remedy; does the Public Health Act help us at all by making the owner or occupier of the property liable for the improper use of the privy."

Answer.—There is no provision in the Acts directly affecting the point raised. A Local Authority may, however, in our opinion, reasonably refuse to remove the contents of any privy which is improperly used. Sec. 43 of the Act of 1875, it may be observed, prescribes a penalty against a Local Authority who have undertaken or contracted for the removal of house refuse, &c., when they fail, *without reasonable excuse*, after notice in writing to remove such refuse. In our opinion the misuse of the privies will justify the Local Authority in refusing to remove the refuse, for such nuisance will constitute a "reasonable excuse." The Local Authority are advised, however, to issue notices to the occupiers before taking the step indicated, when the practice will no doubt be greatly lessened.

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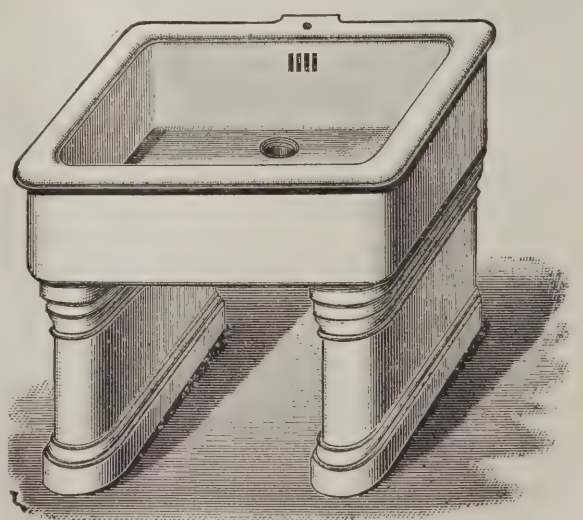

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The sewage of Crewe, which is practically domestic —not containing much trade effluent—is at present dealt with at the sewage farm which was laid down in 1872 at a capital expenditure of £47,000, and which has an area of 260 acres. This whole area has a subsoil of stiff clay. Willows and rye grass grow upon the farm.

The sewage flows by gravitation to the lowest portion of the farm along two main outfall sewers; the northern capable of taking 14 million gallons in twenty-four hours, and the southern with a like capacity as far as the gasworks in Victoria-avenue, but beyond that point only equal to 10 million gallons in twenty-four hours. The sewage is pumped untreated, and is delivered by elevated and ground-level carriers at whatever point is desired. The pumping is done by a beam engine, which can lift 100,000 gallons per hour. After passing over the land, the effluents flow into two streams, the North Brook or the South Brook, each of which ultimately discharges into the river Weaver.

Owing to the facts that the subsoil is stiff clay, and that the population of the town is rapidly increasing, and this method of sewage disposal not proving altogether satisfactory, it has been decided to dispose of the sewage from the northern outfall (about one-fifth of the total quantity) by the bacterial method. Excavating operations are in progress at the present time, and it is expected that the bacterial beds will be ready for use about next June.

The following is a brief account of the lines which will be adopted:—The sewage will pass from the northern carrier direct into a detritus tank, thence passing through screened openings (to keep back paper, rags, and other matters which are not properly sewage) into an open septic tank of sufficient capacity to hold one day's sewage. This septic tank will measure 186ft. by 50ft., will rise from 9ft. to 10ft. 6in., and will have a capacity of 70652·96 cubic feet. This tank will have its walls and bottom lined with blue brick and cement, and in this part of the process the anaërobic organisms will act in such a way as to liquefy the solid excreta. The fluid sewage will pass through this tank slowly, and be drawn off about 2ft. below the surface by means of Adams' automatic distributing apparatus on to a primary bacteria bed. The distributing channel will be of shallow depth to allow of the aëration of the sewage as much as possible.

There will be five primary and five secondary beds, and the tops of these secondary beds will be about 1ft. below the bottom of the primary beds. Each bed will measure 71ft. by 41ft. approximately, and will have a cubic capacity of 16,089 cubic feet. In this part of the process the aërobic organisms will have full play, and convert the liquefied organic matter into more stable, non-putrefactive substances.

The operation of filling the beds will take place as follows:—Bed No. 1 first commences to fill through the sewage inlet feed. The sewage rising in the bed locks air within a dome connected to the feed, which creates sufficient pressure to cut off the supply when the primary bed is full. At the same time it releases the feed to bed No. 2, which then begins to fill, stops off, and releases feed to No. 3 in the same manner, and so on throughout the series. When the bed is full the sewage is held up for the desired period of contact, which is governed by the filling of the small chamber in which the withdrawing syphon is placed with effluent from the bed, which enters through a tap. The tap may be altered to give any desired period of saturation.

When the chamber is full the syphon discharges, withdrawing the liquid contents of the primary bed, and delivering on to the corresponding secondary bed below, where it is again held up for contact in the same manner as before, being finally discharged as effluent into the brook.

After a bed has been emptied it remains open for aëration until each other bed in the series has been filled in turn, when the supply is again brought on, all the requisite operations being brought about in proper sequence, without movement or attention.

The beds will be arranged so that each may be worked on an eight hours cycle, that is to say, approximately—two hours for filling, two hours for standing quiescent whilst the bacteria are doing their work, one hour for drawing off the effluent, and three hours standing empty for aëration. Arrangements will also be made for resting each pair of beds for one day in every eight days for recuperation and aëration; also the scheme allows for drawing off of 4ft. 6in. of effluent, only leaving 6in. approximately in the bed.

It is proposed to construct the beds, &c., as follows:—The tank will be excavated in such a way that its sides will slope two to one, and will then be covered with a 6in. layer of concrete floated up to a smooth surface. The distributing channels and beds will be constructed in like manner, but with a 4in. layer of concrete only. Upon the bottom of the filter beds a central line of dry brick effluent drains will be laid with open joints, and radiating lines of 4in. common land drain pipes, also open jointed, arranged herring-bone fashion, placed 3ft. apart and running into the brick mains. The material used for filling the beds will be screened clinker obtained from the London and North-Western Railway Works, and not more than 1½in. gauge or less than ¼in. gauge. The whole of the material will be washed and screened under the Borough Surveyor's supervision before it is placed upon the beds. Upon the surface of the filtering media wooden distributors are to be placed, to consist of a 6in. main with 4in. side branches spaced 6ft. apart, pierced with ⅜in. round holes both in bottom and sides of the trough at intervals of 18in., and to be properly connected up to the syphons. There will be automatic syphons to the beds capable of dealing with 500,000 gallons of sewage per day.

* From the annual report of Dr. Alfred Greenwood, M.O.H. for the Borough of Crewe.

THE NEED FOR A MINISTRY OF PUBLIC HEALTH.

At the last meeting of the Lancashire and Cheshire branch of the Association of Sanitary Inspectors, a paper on the above subject was read by Mr. Fred Scott, F.C.A., secretary to the Manchester and Salford Sanitary Association. We have already given a summary of the paper, but the subject is of such great importance that we now give it in full.

The subject which I have chosen for this paper being one involving questions of high State policy, it would seem presumptuous for an obscure layman to approach it, and if it had not been frequently discussed by persons whose claim to be heard is incontestable, I would scarcely have dared to deal with it. But when such distinguished sanitarians as the late Sir Edwin Chadwick, a past-president of your Association, and the late Dr. Benjamin Ward Richardson, deemed the proposal for the creation of a Ministry of Health worthy of their strenuous advocacy, it seems no more than a respectful tribute to their memory to revive the idea. One never knows how in the ways of Providence things are ordained so that great results sometimes spring from most insignificant beginnings, just as the tiny acorn dropped on suitable soil develops in time into the widespreading and majestic oak tree. The soil in which it seems desirable that this idea of a Ministry of Health should germinate is the brain of an able and disinterested Member of

Parliament or Peer, who sees more utility in mastering and devoting his life to the attainment of one great object than in diffusing his effort over the multifarious questions that are dealt with in one or other of the Houses of Parliament, and failing to make a distinct mark on any of them. Indeed, experience shows that it is only by that concentration of interest and effort which constitutes enthusiasm, persistently applied to the advocacy of any reform in this country, that adequate progress can be made with it, unless, indeed, public opinion is electrified by some great catastrophe.

The late Sir Henry Cole, the organiser of South Kensington Museum, once told me that the late Prince Consort, when asked to help any new movement, invariably asked in the first instance, "Who is your madman?" and had to be assured of the enthusiasm of the moving spirit before he would lend his name. Sir Henry dabbled a little in sanitary reform himself as well as art matters, and he was very fond of relating what he described as a favourite joke of the Prince, viz., that when the latter wanted anything doing in which he thought Sir Henry could help, he sent for him, remarking that he found it impossible to raise steam without coal (Cole). What is wanted is a man not too old to be enthusiastic, but with sufficient ability or experience, or both, to command the ear of the House in which he sits, and who will lose no opportunity of educating Parliament on the advantages of possessing a Ministry of Health. Instances in illustration of this essential factor might be multiplied, but I need only mention the achievements of Mr. Henniker Heaton, M.P., in connection with postal reform, and the late Mr. Plimsoll in respect of protection of seamen. The only other method by which desirable reforms are rapidly effected is the occurrence of some great catastrophe which gives a shock to the public mind, or some severe test of a system which has been allowed to grow up from beginnings based on no well-ordered scientific plan. Of the former, the best illustration is perhaps the sanitary legislation of the past thirty years. It may safely be stated that it was the death of the Prince Consort from typhoid fever, and later the serious illness of his present Majesty from the same complaint, which gave the impetus to sanitary reform and the demand for legislation which provided the present system of health administration. Even such an advanced reformer as Sir Edwin Chadwick had never been able to secure any more efficient form of health administration than the General Board of Health, of which he was the chief executive officer. The effect of testing a system under a severe strain has been well illustrated in the present war, and the War-office, which has, like all our Government departments, grown up under bureaucratic influences, has not appeared to advantage under the test. Thus in delaying reforms in administration until any particular department exposes its weakness and inefficiency under severe strain, we elect to live in a fool's paradise. But, it may be urged, how can the proved inefficiency of the War-office be taken as a parallel for health administration under the Local Government Board? I reply, that we have to judge by results in both cases. It is generally admitted that if our War-office had been efficient the present war could never have become so serious a matter as it has proved, and that the cost of inefficiency has been thousands of lives and many millions of money. For the hundredth time we are going to lock the stable door after the horse has been stolen. But even that object lesson will not move anybody to question the folly of delaying the reform of health administration, and yet issues of vastly greater importance than those depending upon War-office reform are involved. In this war not more than 7000 men have been killed in action and died of wounds, and about double that number have died of disease, say 20,000 in all. But in the United Kingdom there are about 120,000 preventable deaths every year, and yet we accept such a condition of things as if it were inevitable. The most convincing proof of the inefficiency of our system of health administration is the fact that such an enormous death toll for disobedience to the laws of health still exists. The public mind is satisfied with the assurances given from time to time of apparent progress, indicated by reduced mortality from certain diseases, or success in coping with a threatened epidemic. Yet all the time we are, as it were, dwelling in a charnel house, and progress towards that ideal time, when the presence of a case of zymotic disease in any community would be regarded with almost as much wonder as the re-appearance of a specimen of the old British wolf, must necessarily be slow, while we regard our present fearful death toll as inevitable, and contentedly submit to a system which stands as much condemned by our vital statistics as the War-office does by recent events.

It must be admitted that under the present system an excellent organisation for the prevention of disease has been developed; but what is the use of the machinery if the hands of those who could and would work it are more or less tied? It cannot be denied that the extension of Local Government and the devolution of administration in many departments of government in this country has been on the whole highly beneficial, but there are certain matters for which it is essential that the administration should be centralised or at least that the Government Departments should not be merely nominal boards of control, but bodies whose duty it was to see that the law was properly administered by Local Authorities. Thus in the adminstration of justice (Home-office), military affairs (War-office), education (Council of Education), trade (Board of Trade), agriculture (Board of Agriculture), and others, Government itself exerts a direct control, whereas in the matter of health the Local Government Board, even though its President may be a Cabinet Minister, as at present, cannot be said to exert any active control. Of course it has to formally sanction bye-laws, authorise loans, &c., but how rarely is its power employed to require recalcitrant Local Authorities to enforce the law? Indeed it has come to this, that a Local Authority has only to act in defiance of the Board, and it may practically do as it likes. How often does it happen that a municipality has already spent money on a particular work before even asking the permission of the Board to borrow it as required by law, and how often do we see reports of Boards of Guardians and other Local Authorities under the nominal control of the Local Government Board openly treating its communications with contempt? It was only the other day that it was claimed for a neighbouring Local Authority that it had gained a victory over the Board by obtaining permission to do some works of drainage. For years it has withstood the Board in respect of its requirements as regards sewage disposal. Naturally, a Board that is unable to enforce its requirements in such matters must have very little influence in the minor details of health administration. The interests of the public health cannot be properly attended to while they form only a section of the charge of an already ineffective department, and yet are of vastly greater importance to the well-being of the country than most of those interests now forming the sole charge of departments whose chiefs are *ipso facto* Cabinet Ministers.

If the importance of a branch of administration is what determines its claim to be a distinct department controlled by a Cabinet Minister, then health ought to be regarded as second to none. There have been few statesmen whose dictum on this point would be as weighty as that of the late Lord Beaconsfield. When, as Mr. Disraeli, he was Prime Minister, he said, "The health of the people is really the foundation upon which all their happiness and all their power as a nation depend. It is quite possible for a kingdom to be inhabited by an able and active population; you may have skilful manufacturers, and you may have a productive agricul-

ture; the arts may flourish, architecture may cover your lands with temples and palaces, you may even have material power to defend and support all these acquisitions, you may have arms of precision, fleets of fish torpedoes; but if the population of that country is stationary, or yearly diminishes in stature and strength, that country is ultimately doomed. The health of the people is therefore, in my opinion, the first duty of a statesman."

But in estimating the importance of the Public Health Service as a State department, we have something more to consider than a statesman's generalisations, which are liable to be discounted as platitudes used for party purposes, although it is in itself a recognition of the importance of the subject that a party leader should select the subject as one on which his party claimed support. The work of a well-organised Health Department is reproductive. It means the saving of many thousands of lives yearly. Eminent writers such as the late Dr. Farr, the great health statistician, the late Sir John Simon, Medical Officer to the Privy Council, Mr. Humphreys, and others, have endeavoured to assess the money value of a human life, or the difference between earnings and cost of maintenance, and the sum which they approximate to as the average value is £200. Now, taking 120,000 preventable deaths each year, they represent a capital loss of £24,000,000, but every death represents perhaps five cases of sickness, all involving heavy pecuniary loss. Thus on pecuniary grounds alone it pays to secure the greatest possible efficiency in health administration.

But there are more serious considerations still than those of a financial character. The chief is that referred to in the quoted utterance of the late Lord Beaconsfield, which was only stating in prose what Goldsmith so truly expressed in verse—

> "Ill fares the land to hastening ills a prey,
> Where wealth accumulates and men decay."

It has been frequently stated, amongst others by Mr. T. C. Horsfall (on the authority of the late Commander-in-chief—Lord Wolseley, I believe) that there has been a marked falling off in the stature and general physique of the soldiers recruited from manufacturing districts, and this is not to be wondered at when we remember the insanitary conditions under which the class from which the rank and file of the army is drawn, exists. Surely Lord Beaconsfield was right in stating that the country where such deterioration is allowed to go on, is doomed. It is only a question of time; the doom is only delayed while the stamina of the race is maintained by the rural population, but we know that the conditions of population are rapidly changing. Not more than fifty years ago the rural population far outnumbered that in the towns; now the position is reversed, and a much larger population exists in the towns than in the country. In another half century the same process will probably leave a very small population of peasants to recruit from. It seems, therefore, the height of folly, the entire abnegation of true statesmanship, to allow the interests of the public health to remain any longer subordinate to those selfish interests which are now too generally represented in the bodies charged with the administration of the law.

The very fact of recognition by the State of the pre-eminent importance of the interests of the public health, by advancing the controlling department to the rank of a Ministry, would in itself exert a powerful educational influence. But it would do much more. The change would involve many improvements in the organisation of the health service. Thus uniformity, as far as local condition would permit, of the bye-laws of all Local Authorities, the direct responsibility of Medical Officers of Health and Sanitary Inspectors to the Central Authority (this implying security of tenure of offices to such officials, and consequently their independence in seeing to the effective administration of the law); all matters affecting public health would be dealt with by the Health Ministry instead of being divided between the Local Government Board, the Home-office, and perhaps one or two other departments as at present, and a well-organised Health Ministry would supply the standards of sanitary necessities for the army, the Colonies, and other dependencies, thus rendering valuable help to those dapartments. A Health Ministry would have a special care to the perfecting of health legislation, and perhaps one of the first things to be done in this direction would be the alteration of all the "mays" in the Public Health Acts into "shalls." At present it is left entirely to Local Authorities to seek powers as they desire them to meet local requirements, involving heavy charges on the rates, in promoting Bills or Provisional Orders which might at a minimum cost be obtained for them by a Ministry of Health.

I have referred to the work of making local bye-laws as uniform as possible. The importance of this in respect of building bye-laws will be well understood by all present. But to emphasise it I may state that the present building bye-laws of Manchester, which were only obtained after a prolonged agitation by the Manchester Society of Architects and the Manchester and Salford Sanitary Association, would, if strictly enforced, effectually prevent the erection of any more "jerry" property within the city; yet in some of the suburbs the speculative builder is to-day erecting dwellings which in a generation or less must become slums, and thus the evils of the past are being perpetuated. This is a thing in which Local Authorities ought certainly to be controlled by a strong Central Authority.

To you practical men, many other arguments in favour of the creation of a department which would at once greatly increase your power of serving the community, and correspondingly enhance the dignity of your office, must suggest themselves. I have tried to state a few reasons justifying the formation of a Ministry of Health. However feeble my effort, it will be useful if it has no other effect than that of keeping the subject alive, and perchance suggesting to some more powerful pen and influential voice to take it up. Let those who see in the proposal as I do the basis of reforms which would work out the physical salvation of our country, talk with others about it as occasion offers until, on the principle of the snowball, which gains in size and weight as it is rolled along, the proposal may soon come to be a matter which can no longer be ignored by Government.

LEEDS SANITARY AID SOCIETY.

The annual meeting of the Leeds Sanitary Aid Society was held last week in the Lord Mayor's Rooms at the Town Hall, when the Lord Mayor (Ald. F. W. Lawson) presided.

Mr. Michael Teale (hon. sec.) read the annual report, which stated that in the early part of the year several series of lectures were given in various parts on elementary sanitary subjects, dealing chiefly with the disposal of household refuse, the necessity of fresh air and good drainage, and the prevention of the spread of infectious diseases. At the monthly meetings of the Society many of the larger sanitary questions were discussed, questions such as the substitution of public abattoirs for private slaughter-houses, the possibility of ventilating public sewers in a more satisfactory manner, and the housing of the working classes; and at every meeting more detailed matters concerning insanitary conditions in the poorer parts of the city have been carefully considered, and steps taken to bring about an improvement. The Committee were glad that in some cases the Society's intervention had been followed by most satisfactory results. Much of the Society's use-

fulness lay in this latter direction, and accordingly the Committee asked for the co-operation of all members of the Society in observing and bringing before their monthly meetings all nuisances and insanitary conditions among the poor which came before their notice. The importance of leaflets as a means of education in simple but important principles regarding health was pointed out, and their issue is to be continued. Though the Committee have ended the year with a balance in hand, they mention that much of the balance is in connection with the wide circulation of these leaflets. The scope of the Society's work has been seriously limited in the past by lack of funds, and there is much more work which should, and would be undertaken if subscriptions on a larger scale were forthcoming.

The Lord Mayor, in moving the adoption of the report and balance-sheet, remarked with pleasure the increase in the balance, and as to their work, he said he had no doubt that to the inhabitants, especially in such a quarter, for instance, as that in which his works were located—where, to 45 per cent. of the people sanitation was an unknown quantity—it would be a great advantage to the city. Of course, the Corporation, by their insanitary area scheme, involving the outlay of a vast sum of money, were rendering first aid, and it was felt that if they could get rid of the courts and back areas, and let a breeze in among these slums, they would be doing a great deal for the health of Leeds. As regarded public abattoirs, he thought they would find that these were already working, and he believed the butchers of Leeds were very much pleased with them. He did not know whether the Society suggested that they should be put all over the city, for that would be rather difficult, inasmuch as there would be the removal of the refuse; but he understood from Ald. Knowles that the abattoirs they had were working very well. The abattoirs at Copley Hill had not been much used, being rather difficult of approach; and it was very awkward for the public that beasts should be driven through the streets. Now-a-days one heard all kinds of rash proposals, and the latest he had heard was that the carriage of the beasts should be undertaken by the tramways. We lived in an advancing age, and what would be done in the future he could not say, but anything that would prevent the driving of infuriated beasts through such thoroughfares as Commercial-street and Briggate would be a great advantage to the city. In conclusion, the Lord Mayor observed that the Society was doing a very useful work, but in a large city one was apt to overlook it in the multitude of organisations. He was glad to have that opportunity of recognising the fact by asking that he should be included in the list of subscribers.

The Vicar of Leeds seconded the motion. He explained, in regard to the abattoirs, that there were still a number of private slaughter-houses existing in the city, and that if the Corporation could bring pressure to bear on the owners to induce them to make use of the public abattoirs it would be an immense blessing to the city. Through lack of funds the Society had been obliged to dispense with the services of an Inspector for some two or three years past, so that more money was urgently needed if they were to carry on their work energetically. He believed that Dr. Cohen and Mr. Teale would be able to initiate a vigorous policy. The Vicar enlarged on the great good that might be done by means of leaflets, and wished it to be known that the Society's funds in hand were all required in connection with the printing and distribution of these leaflets.

The motion was agreed to.

The Rev. C. Hargrove, moved the re-election of officers and Committee, including the Bishop of Rochester as president, Dr. Trevelyan hon. treasurer, Dr. Cohen and Mr. Michael Teale hon. secretaries, and the Vicar of Leeds chairman of Committee.

Dr. Hartley seconded the motion, which was carried.

A hearty vote of thanks to Mr. Robert Jowitt and Mr. Teale for their services as hon. secretaries, and to Mr. Matthews as hon. treasurer, was passed on the motion of Mr. B. D. Marshall, and a vote of thanks was accorded to the Lord Mayor and to the Corporation for the use of rooms during the year.

In reply, the Lord Mayor said the Corporation welcomed the assistance which such a Society might render in the interests of the city.

THE MIDDEN-PRIVY AS A DISSEMINATOR OF TYPHOID.

In a summary of the insanitary conditions attending an outbreak of typhoid in York during the second half of the past year, Dr. Edmund M. Smith, the Medical Officer of Health for the city of York, blames the midden-privy as being the chief source of the contagion. He says:—

Of 171 houses affected during the second half of the year (30 at least of which were to be described as dirty), 97 possessed midden-privies, and 74 water closets.

At the midden-privy houses there occurred 124 cases, 27 being secondary to cases occurring at the same house, and five of the cases (all single cases) had undoubtedly contracted the disease outside York, so that the net number of midden-privy houses probably having something to do with the causation of fever in the city was 92 (with a net of 119 cases). The large majority of the midden-privies were more or less foul or leaking, so foul as to constitute nuisances; at 30 of the 97 privy houses there were positive defects of drainage also.

At the 74 water-closet houses there occurred 97 cases of typhoid fever, 23 being secondary to cases occurring at the same house, and not less than 12 of the cases (all single) had contracted the disease outside York, so that the net number of water-closet houses having some connection with the causation of fever in the city was 62 (with 85 cases net). Of the remaining 62 water-closet houses deduct five where there is reason to believe (there being no sanitary defects at these five houses) that the patients contracted the disease elsewhere within the city in attending upon other cases. We have now 57 to consider. Of these not less than 27 had some defects of drainage (*i.e.*, drains passing under the houses defective, drains choked, defective rain-water downspouts, defective yard-gullies). At least 16 were to be described as decidedly dirty; 10, having no defects of drainage, were distinctly associated with conditions of polluted soil, in addition to practically the whole of the 20 water-closet houses, in which were also houses dirty and houses with defective drains. In fine, there are only 15 water-closet houses in which we fail, so far, to find any clue as to the possible or probable origin of the case, there being no defects of drainage, no obvious pollution of soil, no history of possible origin, outside the city. In four only the householders complained strongly of offensive sewer ventilators.

Thirteen houses affected during 1900 had been affected with typhoid fever during the previous six years, and 12 out of the 13 were midden-privy houses, and affected midden-privies are, in my opinion, capable of affecting many other houses than those to which they belong. Practically all the privies have led to more or less pollution of the soil, and cats, mice, birds, and flies, in my opinion, play an incalculable part in the spread of contagion. In at least 87 of the 171 houses, the drain was not disconnected from the sewer or properly ventilated, and of these at least 25 of the drains pass under the house.

Rain-water downspouts:—Fifty-six were found to be

connected direct to the drain; 42 were not disconnected from the street sewer; 10 were not disconnected from the sewer, and received the waste-pipe from the roof of the bay window, immediately below a bedroom window. A large number of the fall spouts connected direct to drain or sewer were found to have open joints. In 19 instances the sink waste-pipes, or the gullies in the yard over which they opened, were untrapped or in some way or other defective. In at least 50 instances the yard-pavements of the houses were incomplete or defective, and permitting of pollution of the subjacent soil. In at least 53 instances the sewer ventilators or street gullies were complained of as acting offensively as outlets of sewer gas. Nearly every typhoid-affected house complained of either the sewer ventilators or the street gullies.

Taking the whole of the cases into consideration, I find that the majority were associated with the existence of midden-privies, most of which were more or less foul or leaking, with uncemented walls and floors, in not a few instances with dilapidated walls, most of them permitting of the pollution of the adjacent soil. The cementing of the walls and floors with many of the privies is insufficient to prevent pollution of the soil, as it is often cracked and so permits soakage; a large number of them are found inches deep in liquid filth, or so full of refuse as to reach above the cemented portion of the walls.

Furthermore, a large proportion of the midden-privies, especially in the Leeman-road, Newboro'-street, and Bishopthorpe-road districts, have become specifically infected by the excreta of typhoid fever cases in previous years. The number of these has, of course, become largely increased this year, before measures could be taken to prevent their infection, and by cases in the early stages of the disease. Next to midden-privies, defects of house drainage were most associated with the occurrence of the disease.

During the summer of 1899 the neighbouring surface sewer ventilators and street gullies were frequently acting offensively as outlets of sewer gases. The sewers were investigated and were found to possess very slight fall, and they contained extensive deposits. The sewers were therefore re-laid under improved conditions and with much better gradients, and I have heard little or no complaint of their ventilators during the summer of 1900. The work of re-laying the sewers was completed in May, 1900, some weeks before the fever commenced to affect the district.

Whether or not sewer gas had any connection with the outbreaks of typhoid fever in this district during the years 1899 and 1900 is doubtful; it is impossible to say (we have no positive evidence); it may or may not have had some influence. But when one considers the hemmed-in position of the midden-privies in the district, the number of them previously infected by typhoid excreta, and the enormous numbers of flies to be observed during the summer months playing around middens, kitchens, and pantries (cats and mice must also not be forgotten as possible carriers of contagion), I am convinced that the midden-privies of the district were the chief source of the contagion.

"In my opinion, York," says Dr. Smith, in conclusion, "is a town for which midden privies are not suitable, taking into consideration the flatness of its level, its porous, absorbent soil, its narrow streets and numerous yards or courts. It is pre-eminently a town for the water-carriage system throughout, although that system, it must be said, calls for perfect drainage, and for free ventilation of the sewers."

The Tamworth Town Council has decided to build a number of cottages under the Housing of the Working Classes Act.

ANNUAL REPORTS.

Auckland.—The annual report of the Medical Officer (Dr. McCullagh) shows that during the year there has been 265 deaths in the town, 49 of which occurred in the workhouse. Of the deaths in the workhouse 29 belong to the town, and 20 to the rural districts. The death-rate for the year was 19·2, as compared to 22·5 for the previous year. Seventy-two of the deaths were those of children under one year of age, giving an infant mortality rate of 193, an improvement on the previous year, when the rate reached 220. The zymotic death-rate was 2·003, as compared with 4·7 for the previous year. There were thirteen deaths from various forms of cancer. There were 33 cases of enteric fever notified, as compared with 157 in 1899. He appends a list of enteric fever cases in the whole county, and from it he adduces the moral that there was a common cause for enteric fever in the eastern portion of the county of Durham. When the cases increase in the whole county there is an increase in Auckland, and when the disease diminishes in the county it diminishes in Bishop Auckland. And the only common cause which has been pointed out is the presence of privy-middens, defective drains and sewers, and the necessary accompaniment of polluted soil in close proximity to dwelling-houses. The almost entire absence of enteric fever from houses provided with water-closets has again been most marked. During the past year the water supply has been most satisfactory, and the filter bed has acted well. With a second filter and larger storage the risk of any contamination will be reduced to a minimum. The report concludes by paying a compliment to Mr. Sanderson, the Sanitary Inspector.

Bideford.—The annual report of the Medical Officer of Health for Bideford shows that the death-rate exceeded that of 1899, being 16·4 per thousand, which includes persons dying within the borough but actually belonging to the outside district. Those deaths have been much above the average. Infant mortality was less than for the previous three years, the rate being 111·1 per thousand. In this connection, printed "Hints to Mothers for the Feeding of Infants" were being circulated. Persons between the ages of one and five suffered most this year, nearly half the deaths being due to measles and whooping-cough. Comparatively few children had succumbed to chest affections. The zymotic death-rate was a little lower than the previous year—2·4 against 2·9; this included deaths from diarrhœa. Notifications for the year were:—Enteric fever, 6; erysipelas, 8; puerperal fever, 2; measles, 372; the majority of the cases were of a mild type. The infectious diseases hospital was not required during the year. During January, 1900, influenza caused much sickness; May was remarkable for a low death-rate—7·3 per 1000. Measles continued more or less until the end of August. In November and December the death-rate was much below the average. The Sanitary Inspector inspected 773 houses, finding 110 defective; 16 new houses were erected and 20 cottages renovated; 18 houses were disinfected and limewashed. The total number of nuisances abated was 107. Ten houses were condemned; scavenging had been effective; dairies and cowsheds were frequently inspected and nine samples of milk analysed, all being of good quality; slaughter-houses were periodically inspected. The public slaughter-house did not receive the patronage it deserved. Two seizures of unsound meat were made. Dr. Gooding suggested that the Authority should get into closer touch with the vendors of milk, and mentioned the plan of issuing certificates or licences, and publishing a list of those dairy farms that subjected themselves to inspection. This would be some guarantee to the public for the purity of the milk and the cleanliness of the premises. The Medical Officer

referred to the intermittent water supply during the summer. He said that to the best of his knowledge no actual want of water occurred. The quality of the water remained good throughout the year. The total rainfall was 39·3 inches, as against 38·18 inches in 1899.

Crook.—The annual report of Dr. Mackay, Medical Officer, Crook Urban District Council, states that during the year there were 376 births and 200 deaths. There is a decrease in the infant mortality. In dealing with sanitation the Medical Officer says the diminution of diseases due to insanitary surroundings is doubtless owing to the climatic conditions, and not to any marked improvement in the sanitary condition of the district. Amongst the sanitary requirements the Medical Officer points out are the abolition of midden privies, an isolation hospital, and public slaughter-houses.

Hartismere.—The annual report of Dr. E. G. Barnes upon the sanitary condition of the Hartismere rural district is a pretentious pamphlet, comprising some twenty pages of reading matter. Statistics relating to births and deaths are given *in extenso* in elaborate tables, giving comparisons for the past ten years. Last year 260 births were registered in the district, being at the rate of 20·6 per 1000 of the population. The rates in former years were:—1895-9, 23·6; 1890-94, 28·0; 1885-89, 29·8; 1880-84, 32·2;1870-79, 31·3. The decline in the averages appears to indicate that the younger adult population has probably undergone a very considerable decrease from migration to more populous centres. The coming census will determine whether this opinion is well founded or not. The birth-rate in the district is considerably below the general birth-rate for England and Wales, which was 28·9 in 1900. The number of marriages, which has shown a decided decrease in recent years, increased in 1898 and 1899. The returns for 1900 are not yet complete. The figures for the previous five years are:—1899, 104; 1898, 95; 1897, 77; 1896, 82; 1895, 76. The Registrar-General has repeatedly pointed out that a high or low marriage-rate bears a close correspondence with the prosperity or want of prosperity of the country. The number of persons married in the Hartismere rural and Eye urban districts during the ten years 1889-98 was at the rate of 11·9 per 1000 annually, which is much below the corresponding rate for England and Wales—15·6 per 1000. As regards deaths, the total in the district was 171, being 13·6 per 1000. The rates in former years were:—1895-9, 14·4; 1890-94, 17·1; 1885-89, 15·7; 1880-84, 16·0; 1870-79, 18·0. The mortality of children under one year of age was 21 per cent. of the total deaths and 13·8 per cent. of the registered births. This rate is somewhat excessive in comparison with former years. Zymotic diseases have shown a very satisfactory decrease in the district during the last five years. Scarlet fever was less prevalent than usual; eleven cases occurred in the Botesdale Division, four in the Medlesham Division, and one in the Eye division. Diphtheria prevailed to a small extent in the Eye and Botesdale divisions, whilst thirteen cases of erysipelas were reported throughout the district. The work of systematic inspection and nuisance removal has been carried on as in former years, and the sanitary state of the district is well maintained. No fewer than 253 notices were given for sanitary improvements. Dr. Barnes made chemical analyses of seventeen specimens of drinking water, and reported seven "unfit" for drinking or domestic uses, the result of which was that thirty-six houses during the year received an improved supply of water. Attention is called to the fact that the water supply at Wickham Skeith is defective, fifteen houses in the street, near the Swan Inn, being without any satisfactory supply; but at last there seems reason to believe that a suitable site for a public well has been secured, and that the work will shortly be commenced. The number of cases of infectious diseases notified during the year was 39. As regards vaccination, the following paragraph from last year's report still holds true. Dr. Barnes says:—"The working of the new Vaccination Act has resulted in more children being vaccinated than under the old Act, the number of parents availing themselves of the so-called 'Conscience Clause' being small. The provision of calf lymph and the operation being done at home have both contributed to the successful working of the Act."

Irvine.—The Medical Officer for the burgh of Irvine has submitted his annual report for the year just ended. In 1900 there had been 193 deaths, which gave an annual mortality at the rate of 21·35 per thousand of the estimated population. The death-rate for the previous twelve months was 18·47, which shows an increased mortality of 2·88 per 1000 for 1900. Last year's death roll also exceeds that of 1899 by 66 deaths. There was, however, the doctor stated he was glad to be able to say, a decrease in the number of cases of infectious disease in Irvine, only 90 cases being notified last year, as compared with 143 for 1899. As usual, scarlet fever was the most prevalent, there being 57 cases, or 63 per cent. of the whole number of infectious cases notified. Forty scarlet fever cases had been treated in the hospital, as well as twelve cases of enteric and three of diphtheria. There had been a few deaths from scarlet fever. In 1900 92 marriages had been registered, as compared with 71 in 1899.

THE INSTITUTE OF SANITARY ENGINEERS

(INCORPORATED).

OFFICIAL TRANSACTIONS.

"THE CLEANSING OF CESSPOOLS."

(*Concluded from page* 267).

A NEW METHOD.

The method I refer to in the following sections is one which I have had experience in the working of, and is known as "the Bexley system," the makers being Messrs. George Waller and Co.

The system is the "essence of simplicity," no skilled labour being required, and it certainly has a superiority over the old-fashioned mode explained in a preceding section. By this process cesspools can be emptied cheaply, quickly, and inoffensively, and this by daylight. As it will be seen from the statistics, a large number of cesspools can be emptied, and though the carts were continually through the streets, no complaints were received.

DESCRIPTION OF PLANT AND COST.

Carts.—Either two or four-wheel vans can be purchased. The two-wheel vans hold 250 and 300 gallons, and the four-wheel vans 300 and 480 gallons.

I consider the two-wheel vans are the most suitable for general purposes, as they are more readily drawn on to the land, though for a flat district a four-wheel van might prove economical, and these possess the advantage of being converted into a serviceable street watering van at a low cost if required.

The carts and vans are built of wrought iron, and made air-tight with air vessel attached to expel the air from the van during the pumping process. Each van or cart is fitted with cast iron bend and union with cap to take delivery hose, discharge valve and hose for distribution of sewage on the land, and the usual manhole or flap.

Pump.—The pump is made with one barrel, and flange unions for the hose, fitted with cap, being specially designed by the makers to go through narrow passages. The pump has no loose parts, the valve covers having hinged bolts. The valves are simple, and

quickly replaced by the man in charge. The pump will readily throw to a depth of 26ft.

Hose.—The delivery hose is made from best oak-bark tanned English butts, well dressed, the punching and riveting being accurately and carefully done—2¾in. bore.

Leather is undoubtedly the best material for the hose, as the wearing qualities are unsurpassed.

The hose, after rough usage (owing to the critical position of certain cesspools, and the wear and tear incidental to cesspool work), has proved itself to be economical.

The hose is supplied in suitable lengths of 20ft., 40ft., and 60ft., each length having gun-metal screw unions, with "quick" round thread.

If, through pressure of work—as is likely to occur during the wet seasons—the cleansing and oiling of the hose be neglected, and it become dry and hard, in such a case it should be well soaked in warm water before being oiled.

The suction hose is made of best vulcanised rubber, fitted with steel spiral wire, embedded smooth bore, and is armoured on the outside with steel wire.

I am not in a position to give the exact outlay that is necessary for a Local Authority wishing to adopt such a scheme, as the requirements of the locality would have to be taken into consideration, together with the description of the plant; but, as a rough guide for members, an expenditure of from £100 to £250 would meet the requirements of almost any district.

PROCESS OF WORKING.

Sulphate of iron crystals are used to act as a suitable deodorant in subduing any odour that may arise from the cesspool. One hundredweight diluted with 48 gallons of water is well boiled in a portable copper, and 1 gallon of the solution afterwards is used to about 450 gallons of sewage; or 1 lb. of manganate of soda mixed in an iron bucket of water until dissolved is an easier method.

Immediately on opening the cesspool, a proportion of either of the above solutions is poured into the cesspool. The men who undertake the work soon profit by experience as to the required quantity.

The pump is brought as near to the cesspool as possible; the suction hose is then let down into the cesspool and connected up to the pump, care being taken to screw the connection tight. A length of the delivery hose is then attached to the other end of the pump, and from thence sufficient hose is connected on to reach to the cart or van, when the necessary connection is made to the cast iron bend.

The wire cage over the air valve is filled with cotton waste saturated with crude Sanitas, which is found very effective in suppressing any unpleasant odour which might otherwise arise as the air is expelled through the aperture, the tap being turned full way during the pumping process.

The time actually occupied in filling a 300-gallon van by the two men who are regularly employed is about eight minutes.

DISPOSAL OF SEWAGE.

In districts where the Council have their own horses it would be a matter of arranging with a neighbouring farmer to take the sewage on his land, or if the prospects are that cesspools might be of a long duration in the district, land could be purchased or rented, and the sewage used to irrigate the land for cultivation.

The alternative is to advertise for tenders and accept the best terms for the execution of the work.

In this way all bisecting and complications of accounts are saved, and the actual total cost of working easily obtained.

Following is a specification and form of tender for this work, which will recommend itself for adoption; the paragraphs being varied to suit each separate case.

To the Chairman and Members of the District Council.

GENTLEMEN,—I, the undersigned, do hereby tender and undertake to execute to your satisfaction the work described in the specification hereunder written, at the price mentioned therein, and agree to the terms and conditions following:—

To supply from ..... 1901 to ..... 1902 on every working day, horse and driver, as may from time to time be ordered by the ....., and at the place and hour, or places and hours, as may be required, and to provide a suitable tip for the sewage, at least one hundred yards from any inhabited house or high road, at the price of ..... per day, and ..... per hour for overtime. The horse and driver shall work ten hours per day, exclusively of the time occupied by meals, and in going to and from the work.

The horse and driver to be subject to the approval of the Council, who may from time to time (without stating any reason), summarily dismiss such horse or driver, which in their judgment is unsuited for the work. The contractor to take the risk of all accidents of any kind whatever happening either to horse or driver, and he shall be chargeable for any damage done.

Any question as to any matter or thing arising out of or incident to this contract shall be left to the ...., whose decision shall be final and binding on all parties.

The driver to strictly carry out all directions given to him on behalf of the Council, and cart and dispose of the sewage at the place provided in this contract.

Dated this ..... day of ..... 1901.

Signature .....

Address .....

Profession or calling .....

ITS ADVANTAGES.

(1) No splashing, or offensive smells.

(2) Ensures the work being done more thoroughly and efficiently.

(3) The contents of the cesspool can be taken through the streets without either noses or eyes being offended.

(4) Less labour, and no risks for the men.

(5) No complicated tackle or machinery.

(6) No unpleasant features.

(7) Great saving of cost.

(8) Work can be executed at a substantial profit.

(9) A large cesspool emptied in three hours.

COST OF WORKING.

Much will depend on the situation of the tip for the sewage, the rate of horse hire, and the proximity of the cesspools in the district; but the following is a fair calculation, as, if reference is made to the statistics, the actual cost per cesspool will work out less than the basis given below:—

	£	s.	d.
Horse and driver per day	0	9	0
Two men pumping per day, 3s. 6d. each	0	7	0
28 lb. sulphate of iron	0	1	0
	0	17	0
Add 20 per cent. for depreciation of plant	0	3	5
	1	0	5

Minimum number of cesspools emptied per day, two. Cost per cesspool on above basis, 10s. 2½d.

STATISTICS.

The following is an exact copy of an abstract from

my books of the actual cost of emptying cesspools by the "Bexley" system for the year 1896.

Quarter ending.	No. emptied.	Labour. £ s. d.	Horse hire. £ s. d.	Sulphate of iron. £ s. d.
March 25th	181	27 12 6	48 8 11	3 0 10
June 30th	177	36 16 0	41 8 2	2 9 6
September 29th ...	191	38 12 6	46 2 2	2 15 7
December 25th... ...	168	34 14 0	44 1 6	2 9 3

Actual cost, 9s. 1¾d. per cesspool.
Maximum emptied per day, 4; minimum 2.

SCALE OF CHARGES.

Where cesspools existed in my district, the Council have emptied them free of charge to the owner or occupier, the expense being borne by a sanitary rate, but in a less populous and scattered district this would not be equity, but the following or similar scale of charges could be adopted.

Cesspools are frequently emptied outside my district on this scale, and owners readily pay the charges which, as will be evident from my papers, mean a source of profit to the Council, the amount thus realised in one year being £58 7s. 3d., and this amount was limited owing to the carts not being at liberty, many orders from outside the district being declined on this account.

Mr. E. R. Boulter (late Surveyor to the Bexley Urban Council) has reported that after one year's working, and after allowing 20 per cent. for depreciation, there was a net profit of £150.

	each. £ s. d
Cesspool containing not more than 1000 gallons ..	1 0 0
" " " " 1200 " ..	1 2 6
" " " " 1500 " ..	1 7 6
" " " " 2000 " ..	1 10 0
" " " " 2250 " ..	1 12 6
" " " " 2500 " ..	1 15 0
" " " " 3000 " ..	2 0 0
" " " " 3500 " ..	2 5 0

The number of gallons in any cesspool is easily ascertained by the number of loads removed, the contents of the van being known, or readily ascertained by its cubical contents. Where two cesspools are within easy distance of each other, and the tip for the disposal of the sewage within half a mile radius, the two could easily be emptied in a day. I do not wish that these figures which are put forward should form a hard-and-fast basis, but as the cost of the work has been carefully abstracted from accurately kept accounts, and the cost of maintenance properly arrived at from a full data of working over an extended period of time, some amount of reliance can be placed on the figures and particulars I have given in this paper.

Reference on drawings.—A, cesspool pump; B, rubber armoured suction hose; C, 2¾in. leather delivery hose; D, iron bend for connection of delivery hose; E, air valve; F, manhole or flap; G, discharge valve; H, hose for distribution of sewage.

At a meeting of the Election Committee, held on the 13th inst., the following gentlemen were elected as Associates:—F. Bovey, Holloway; J. Buckeldee, Hillingdon; J. Whittaker, Pleasington.

At the examination in Sanitary Engineering, held on the 22nd and 23rd inst., the following passed, qualifying for Associateship:—W. J. Lane, Croydon; R. J. McKenn, Manchester.

The following meetings will be held on Wednesday, April 10th, 1901:—Examination and Literary Committee at 3 p.m.; General Purposes and Finance Committee at 4 p.m.; Election Committee at 5.15 p.m.; Members' Sessional Meeting at 7 p.m.

THE Norwich Town Council has decided to adopt Part 3 of the Housing of the Working Classes Act, 1890.

THE AIR WE BREATHE.

LECTURING at Brighouse recently, Miss Alice Ravenhill said that it was usual to complain about the keen rushing winds which blew around the Yorkshire hills, and to say that the weather would be much nicer if the wind would go down, yet a strong rushing wind was one of the best purifiers of the air in the world, and but for them the air would become so filthy that it would be impossible to see the light of day through the murky atmosphere. Seventeen times per minute from birth to death air was carried into and ejected from the lungs of every living person. 2600 gallons of air were thus used by each person daily. An ordinary pail held two gallons, therefore 1300 pailfuls of air were used, and it was essential if health was to be maintained that attention should be paid to the quality of this air. If she had to scrub the floor of that school-room, and then offer anyone a drink of the water used, they would say she was demented, and refuse to drink it, yet every day some of them drew air into their lungs which was infinitely more filthy than that water would be, and thought very little about it. Consequently, it was not surprising that there should be so much disease in large unhealthy towns. Rickets in children was largely the result of bad air; pale faces were traceable to the continued breathing of bad air. It was an awful, but nevertheless true fact, that every year 60,000 persons died of consumption in this country, and although they might say that consumption was traceable to the eating of impure food, yet if everyone would insist upon breathing pure air, their bodies would be in a condition to resist the attacks of disease germs.

BAD AIR IN FOOD.

Many people kept wholesome food in very unwholesome places. Foods absorbed air, and therefore if they consumed food which had been stored in a stuffy cupboard, they also consumed a quantity of bad air. If they dropped a lump of sugar into a tumbler of water and waited, they would see bubbles arising to the surface proving that air existed previously in the sugar, which was escaping from the water. Therefore, their nooks, corners, and cupboards required ventilation and cleanliness if their food was to remain good and wholesome. Air held other matters in suspense. Most of them when returning from a visit to the seaside brought back with them a piece of seaweed to use as a weather glass. If the weed was crisp, they forecasted fine weather; if soft and limp, they looked out for rain. The condition of the weed was determined by the amount of moisture held in suspense by the atmosphere, the salt in it being very susceptible to moisture. In a crowded room they would often see water trickling down the walls, although the place might seem very hot, and, similarly if several people were travelling together in a closed railway compartment they might observe how soon the windows became damp and cloudy, and water trickled down. The water was moisture turned from their bodies into the air with every expiration of breath, and the moisture was very dirty and filthy.

EFFECT OF FIRE UPON AIR.

The natural heat of the body was 98 degrees Fahrenheit, and it was possible to get the thermometer to register somewhere about that figure by breathing upon it. Burning spoiled air from a breathing point of view, as it consumed so much oxygen. A fire badly laid would soon smoulder and die out for want of sufficient air. If they confined a taper in an air-tight space it would quickly go out. As soon as the oxygen was consumed the air was no use for human consumption, as all the life-giving oxygen had been extracted, and its place taken by carbonic acid gas. This gas was not in itself bad, but was usually accompanied by two very objectionable companions, organic impurity and sulphuric acid gas, and there-

fore should be avoided. It replaced oxygen, and if the breathing atmosphere was without the proper proportion of oxygen, the body became bloodless, and the hold on life was insecure. Some people kept clean houses and dirty backyards. Decaying vegetable matter and dust were detrimental to health. Dust was made up of all sorts of things—particles of insects, scraps of skin, bits of deceased matter, &c. There was more of this dust in towns than in country places, and that explained why country people were so much more healthy. Nature had provided each one a danger signal, and their noses would tell them when rooms were stuffy and close. Some people kept the best parlour locked up six out of the seven days of the week, and then wondered why it was close and stuffy. The air outside in the street was often a vast deal purer than in the inside of their houses. If they got an ordinary bottle, filled it with water, carried it into the room they wished to test, emptied the water out, they would fill the bottle with the air of the room. Now if they put a table-spoonful of lime-water in the bottle, shook it up, allowed it to stand for half an hour, they could then tell whether the air was pure or not. If it was impure the lime-water would turn a milky colour, and they should make arrangements for purifying the air of their rooms.

SUNSHINE THE BEST PURIFIER.

When selecting a house, they should get one as sunny as possible, as there was no better purifier in the world than sunshine. When the sun shone, let them throw open their doors and windows, and welcome him with open arms. She knew it was customary to draw the blinds to prevent the sun from taking the colour out of the carpets and curtains, but that was a mistake. The sun was one of the finest tonics in the world, and faded carpets were not so important as faded faces. Carpets could be re-placed, but the maintenance of health was surely a more important matter. It was surprising to find how much impurity there was in the atmosphere. In Leeds alone they daily sent up no fewer than 20 tons of soot, and of that three or four settled gently down upon the streets. Town fogs were formed by the moisture in the atmosphere congealing on to the impurities and preventing proper evaporation. When there was a wind there was no fog.

THE VALUE OF PLANTS.

Plants and trees were the regenerators of the air. They consumed carbonic acid gas, which, with its bad companions, was bad for human beings, and in return they breathed out oxygen, which was good for human beings. Ferns and plants were good things to have in rooms. Window boxes were not only a pleasure to the eye, but also assisted considerably in purifying the atmosphere, and the best thing she could recommend for the maintenance of health was the institution of a system of window ventilation, combined with window boxes on the sill, in which mignonette and other sweet-smelling plants might be planted. She also recommended them to keep plants in the bedrooms during the day, as they consumed carbonic acid gas, and in return gave forth the life-giving oxygen. She thought that it was an advantage to frequently sweep both living and bedrooms with air. She was not a believer in draughts, and did not consider it a good thing for anyone to sit in a draught. There were ways and means of ventilating rooms in such a way as to avoid draughts. If work-rooms and houses were properly ventilated, the workers and children would have better appetites for their food, and although they might consume more food, they would make better and healthier men and women. She knew a case which she would like to relate to them. An Inspector of Workshops on one occasion drew the attention of a dressmaker to the inadequate arrangements for ventilating her work-rooms. Eventually she fell in with these views, and ventilated the workshop. A fortnight later her forewoman came to her and remarked that she had been requested by the dressmaker to ask for an increase of wages, and when asked the reason, the person replied that she could eat considerably more and therefore should have better wages. The dressmaker was a wise woman, and knew that during the fortnight she had had fewer complaints from the customers, the work being turned out better, more of it had been done, so she unhesitatingly fell in with the suggestion of the forewoman, and both parties thereby benefited by the change.

TO SWEEP AIR OUT OF THE HOUSE.

The lecturer specially advised a very agreeable precaution to ensure the air of a dwelling-house being sweet, and that was the first thing in the morning and towards night, twice each day, to throw the windows open as far as possible, and open all doors for the space of two to five minutes. They would then have a free passage of air, and the rooms would soon be filled with purer air. Some present might say that at their house this was impossible, as they had a baby or an old person living with them. To prevent them from catching cold a screen arrangement could be made, with an ordinary clothes horse, covered with a shawl, and through this no draught could penetrate. It was customary to close up all apertures in bedrooms in which persons were lying ill, but thiswas a very serious mistake. The first necessity was to obtain purer air, thus enabling the patient to gain sufficient strengh from the oxygenised atmosphere to throw off ill effects of germs of disease. Draughts were more likely to be felt in ill-ventilated rooms than where proper provision was made for ventilation. They could all work that matter out themselves; if they went into a room in which was burning a good fire, shut all the doors, apply a light to any of the cracks or the keyhole of the door, they would find a draught of air sufficient to blow out a candle. If they threw open a door or window the draught would immediately cease.

VENTILATING THE LIVING-ROOM.

It was essential to proper ventilation that the fresh air should enter the upper portion of the room where the heat gathered, as by this means it became warm before descending to the level of the persons standing or sitting in the room, thus making no perceptible draught. Colds, or what we generally call colds, were most often caused through the person shutting himself up in a closed room, and closing all ventilating apertures. She advised people in every case to sleep with some method of ventilation in the bedroom. Personally, wherever she went she always took with her or had made a board 6in. in depth, and the exact width of the window sash. This board she inserted edgeways between the bottom sash, and thus her bedroom was ventilated by the current of air which gained entrance in the narrow slit provided at the top and bottom of the sash. If there was a strong wind, and the possibility of a draught, it was her custom to place a strip of cotton wool along the narrow opening provided, and this succeeded in converting the wind into small streams of air, which were imperceptible. Another means of ventilating their windows was to drill little holes through the sashes. If they were unable to do that, some other course should be adopted. She wished that it was illegal to build a bedroom without a fire-place. In London this progress had been made, but the movement was much slower in the North, and she supposed that a few years would pass before the Authorities recognised the importance of ventilation. London houses were now being ventilated through grates placed in the outer walls provided with hoppers on the inner side. These grates should not be less than 12in. by 6in. Some builders, she was sorry to say, were now putting in those so-called ventilators not larger than 2in. by 2½in. This was decidedly wrong, and was calculated to lull the occupants into a false sense of security, thus doing

considerbly more harm than good. Some remarks on the disadvantges of large furniture in dwelling-rooms brought the lecture to a close.

THE PLUMBERS' COMPANY AND THE REGISTRATION OF PLUMBERS.

At the annual meeting of the Institution of Heating and Ventilating Engineers, held on February 26th, Mr. M. Greenball read a paper on "The Registration of Plumbers." The paper resolved itself into a trenchant criticism of the Plumbers' Company, but how far the facts were correct may be judged from the following letter addressed to the *City Press*, wherein an abstract of Mr. Greenball's paper appeared :—

Dear Sir,—Our attention has been called to a report in the *City Press* of the 2nd inst. in which statements are attributed to you concerning the registration of plumbers and the Plumbers' Company which are contrary to the fact. For example, it is said you stated that since 1884 the Plumbers' Company has spent probably £25,000 on four Parliamentary Bills. This is untrue. The Company and others have spent considerably more than that sum in establishing a system of instruction and examination for plumbers now carried on in London and the chief centres of the kingdom for the purpose of the national registration of plumbers. Again, the statement attributed to you "that the Plumbers' Company were to be the sole administrators of the plumbing industry, power being reserved to them to alter the various clauses at their discretion when the Bill has become law," is also untrue, as may be seen on reference to the Bills. For example, the Bill of 1897 (amended by the Standing Committee on Trade) gives the Plumbers' Company the right to nominate two members out of 47 upon a general council proposed to be created by the Bill under regulations framed by the Local Government Board, and composed of: (1) Master plumbers, builders, ironmongers, sanitary engineers, and other persons carrying on any trade or business employing plumbers; (2) operative plumbers; and (3) members of public Authorities, Medical Officers of Health, or Inspectors. Under the Bill of 1898 the Plumbers' Company would have the nomination of two master plumbers and two operative plumbers out of a total number of 46. Under the Bill the functions of the Plumbers' Company are limited to keeping the register under the control and in accordance with the direction of the Council. Further, the statement that the Plumbers' Company has "flatly refused" an interview with the City and Guilds of London Institute on the subject of the Bills is also contrary to the fact. No such interview has ever been suggested by the Institute. On the contrary, they have so far refused to meet the representatives of the Company to discuss the matter. In view of these and other statements which are contrary to the fact, we must assume that they have been made by inadvertence, or that you have been wrongly reported. It is, of course, not in our province to discuss your opinions on the subject of the registration of plumbers, but it may be remarked that the object of the registration system is, while duly recognising the claim of persons who are at present carrying on the business of plumbers to be registered without examination, to provide adequate training and examination for the coming generation of plumbers, that they may possess—in the language of the Bill—competent knowledge of and skill in the art of plumbing, and such knowledge "of sanitary appliances and their proper construction and adjustment as may enable plumbers to prevent contamination of water and air in dwelling-houses and other buildings by emanations from drains and sewers." As to the question of inspection, the reply appears to us to be well given from the point of view of the public Authorities by Dr. Alfred Hill, the Medical Officer to the city of Birmingham. He tersely summarised the relations which should subsist between the public Authorities and the plumbers by saying, "It is of no use to have good sanitary arrangements and Sanitary Inspectors unless the plumbing work is well done. The Health Committee want really to make the plumbers their technical assistants." It should be remarked that, so far from its being even suggested by the Plumbers' Company that the registration should be left in their hands, the whole history of the registration movement and the Bills promoted in Parliament go to show that the registration system has been carried out in the past by the co-operation of the plumbers, architects, and public Sanitary Authorities and officials, and it is this system which it is now proposed should be consolidated under statutory powers, and the Government are moved by the Health and Water Authorities of the kingdom, as well as by a memorial of about one-third of the members of Parliament to introduce a measure for this purpose in the public interest. In view of the public interest involved, we purpose forwarding a copy of this letter to the editor of the *City Press* with a request for its publication; but before doing so we think it right to call your attention to the mis-statements of fact which are attributed to you, that you may have an opportunity of making any observations you may desire to make before our letter is sent for publication.—Yours, &c.,

Hunter and Haynes,
Solicitors to the promoters of the Bill.

REVIEWS.

The Practical Guide to the Public Health Acts: A Vade Mecum for Officers of Health and Inspectors of Nuisances. By T. Whiteside Hime, B.A., M.D. Second much enlarged edition. London: Bailliere, Tindall, and Cox. Price 15s.

This volume will, we are confident, be warmly welcomed by sanitary officers, that is, Medical Officers of Health and Sanitary Inspectors, as well as Surveyors. There was prior to its publication no volume containing the whole of the Public Health Acts suitable for such officers, and with annotations, available, such as this contains. The statutes could only be found scattered in a number of publications, or separately, in the Queen's printers' edition. The present volume, however, meets the want, for it contains the chief sanitary laws of England, with annotations, and a *précis* of other Acts of importance to Sanitary Authorities, also all important Orders of the Local Government Board, with memoranda on various subjects of especial interest to Medical Officers of Health and Inspectors of Nuisances; with illustrations, diagrams, and tables, and a selected list of important decided cases on sanitary law.

Dr. Hime was formerly, we believe, a Medical Officer of Health, hence he is able to bring his practical knowledge of the working and difficulties of the Acts to bear upon the elucidation of many of their subtleties. His annotations are copious, and marked by a freshness which enhances the value of the book. The cross references are very copiously and carefully done. Sometimes, however, the author permits his own opinions to unduly colour his annotations, as, for instance, his too candid opinion on page 167 on "Medical Officers of Health paying unauthorised official visits to the private patients of other medical men," and on page 171, referring to Sec. 4 of the Infectious Disease (Prevention) Act, 1890, he asserts, "This Section has

been drawn so as to render it as difficult as possible to effect the object in view"! That Dr. Hime is an enthusiast in the interests of public health cannot be denied for a moment, but it is always desirable to remember that private citizens and owners are entitled to justice and reasonable treatment even from Local Authorities.

Referring to the Vaccination Act, 1898, on page 217, the author injudiciously writes that this Act "will probably be the last, as it will put an end to all vaccination," a prophecy which events have shown is entirely wrong. In his "Hints as to Reports of Medical Officers of Health" he has some scathing and cynical observations as to the Local Government Board and Sanitary Authorities in particular. The Model Bye-laws of the Local Government Board as to new buildings, slaughter-houses, and the various offensive trades, are reproduced in the volume.

"Hints" on the compilation of statistics, refuse destructors, meat, and other kinds of food, water supply, &c., and on various other matters of great value to officers of health, are given. The appendix contains reports of a number of cases on sanitary law decided in the Superior Courts, but these reports are shorn of their value for reference by the neglect to make an index of the subjects, as the reader must wade through every case to ascertain whether it has a bearing on the subject in which he is interested.

The profusion of Latin quotations throughout the book is neither warranted nor to be encouraged. The author may be a good Latin scholar, but such a volume as this is not suitable to proclaim it.

These are, however, minor blemishes in a book which possesses great interest to sanitary officers. Its compilation has been a task in which great care and much thought have been exercised, for it contains almost every Act and Order bearing directly or indirectly on sanitary matters. In our opinion, no Medical Officer of Health can afford to be without a copy in his library, and in like manner it should be possessed by other health officers.

LAW CASES.

Chairman of a Sanitary Committee heavily Fined for Assault.

John Anderson, chairman of the Sanitary Committee of the Walthamstow District Council, of Somers-road, Walthamstow, was summoned at Stratford for assaulting John R. Friend, a member of the same Committee, at Walthamstow.

Defendant pleaded guilty.

Mr. Grubbe, for the complainant, said both men were members of the Walthamstow District Council, the defendant being chairman of the Sanitary Committee. On March 19th, at a meeting of the Committee, Mr. Friend proposed that certain work be at once proceeded with, and this was seconded by a Mr. Geary. Defendant became very angry, and interrupted the proceedings, saying, "Sit down, I will not put the motion." Mr. Friend asked "Why?" The defendant retorted, "Shut up, sit down, I won't listen to you. What do I care for you?" Resenting this, Mr. Friend exclaimed, "I don't care much for such a 'thing' as you." Defendant thereupon threw the head of the chairman's mallet at Mr. Friend, but fortunately missed him. He then sprang from his seat, and saying, "I'll knock your head off," ran down the room towards Mr. Friend. Two Councillors tried to restrain him, but he broke away from them. As he approached, Mr. Friend said, "Don't be foolish. I won't put my hands up to you. If you strike me I'll take you to Stratford Police-court." Defendant, however, hit him a violent blow in the face—an exceedingly cowardly blow, for the defendant was a younger and more powerful man, and Mr. Friend was in a sitting position. The blow drew blood. Dr. Clark attended to Mr. Friend, and while this was being done the defendant said that complainant had made a remark that was insulting to his mother.

Defendant: Quite right.

Mr. Grubbe suggested that this remark was an afterthought. Mr. Friend had two front teeth loosened, and as soon as the inflammation had subsided they would have to be drawn. Two other teeth were also slightly loosened. Defendant had made a public apology to the Council, saying his temper had overcome him, but Mr. Friend, under the circumstances, found it impossible to accept that apology. It was not the first or the second time that the defendant had threatened complainant, and not the first time he had attempted violence.

The defendant denied that he used bad language. When Mr. Friend repeatedly refused to withdraw the sentence in which the word "thing" occurred, he (defendant) lost his temper, and took the word "thing" as a gross insult to his parentage. The utmost malice was brought to bear against him, and those prosecuting him that day had done their best to absolutely ruin him in body and life.

The Chairman (Mr. B. Tabrum): That has nothing to do with this case.

Defendant added that when he discovered that no reflection on his parentage was intended he apologised.

The Chairman observed that defendant had acted as a Justice of the Peace for twelve months, and there was, therefore, less excuse for him. A fine of £5, including costs, was imposed.

What is Trade Refuse?

At Dundee Police-court, before Bailie Melville, James Bruce (13), message boy, Forest Park-road, pleaded not guilty to having in contravention of the eighth section of the rules, orders, and regulations enacted by the Magistrates and Town Council, deposited a quantity of waste paper, sawdust, pasteboard, pieces of wood, and other trade rubbish in an ashpit in Constitution-road, on Friday, 20th March. The case was defended by Mr. J. A. Kyd.

From the evidence for the prosecution it appeared that the boy, who was in the employment of the Dundee Eastern Co-operative Society, emptied two small barrels filled with sawdust, waste paper, broken cardboard boxes, spoiled oranges and chips of wood into the ashpit in rear of the Society's premises in Constitution-road. The stuff was held by the prosecutor as coming under the definition of "trade rubbish" specified in the bye-law in question.

Mr. Kyd said that he appeared on behalf of the Co-operative Society, who were acting in concert with a great many other shopkeepers, who found it a great inconvenience to get rid of the accumulations of refuse in connection with their business. It would be desirable to have a definition of what was "trade rubbish," as he did not think that three or four pounds of shop sweepings could be so defined.

Bailie Melville said he was not going to define what was actually refuse, or what quantity of waste paper might be deposited in an ashpit. He thought, however, that boxes, pieces of wood, and the sawdust came within the clause of the 8th Bye-law. There had been considerable difficulty as to what "trade refuse" actually was. When the question was before the Sanitary Committee it was well threshed out, and it was decided that all accumulations of warehouses and shops should be such. As this case had been brought up as a test case, and Mr. Dewar was not pressing for a penalty, but meant it to act as a warning to others, he therefore dismissed the accused.

NOTICES.

ANNUAL SUBSCRIPTIONS.—The Annual Subscription to "THE SANITARY RECORD," for the United Kingdom, paid in advance, is 12s. 6d. For the Colonies and Abroad, 15s This includes postage, and a Copy of the Diary, post free.

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The Sanitary Record

AND

Journal of Sanitary and Municipal Engineering.

APRIL 4, 1901.

PUBLIC HEALTH IN PARLIAMENT.

THE proceedings in Parliament last week were marked by three measures bearing more or less directly upon the public health. One of these was a Government measure—a Bill to amend the Factories and Workshops Acts, introduced by the Home Secretary; the other two, the London Water Purchase Bill, and the "Pure Beer" Bill, were brought forward by private members for second reading. Of the new Factories Bill little can be said until the Bill itself has been circulated and is in our hands; but Mr. Ritchie said enough to indicate that some of the most objectionable features of the Bill of last year had been eliminated. One of its most important provisions will, we gather, be the transference of the responsibility with regard to the regulations for dangerous trades to the Secretary of State himself, subject, of course, to parliamentary supervision and control, instead of leaving them to be dealt with by arbitration. Another feature is that laundries are now to be definitely brought within the scope of the Factories Acts, and the exemption in last year's Bill in favour of laundries worked as charitable institutions, which Mr. Ritchie himself now admits to have been indefensible, is to be withdrawn. The provisions relating to bakehouses will be strengthened, extended powers given to Local Authorities with regard to sanitation, and certain other additional amendments given effect to, but in the main the Bill will proceed on the lines of last year's Bill. Concurrently with this amending Bill Mr. Ritchie introduced the long-looked-for Consolidating Bill, with the announcement that the two Bills would be pressed forward through Committee *pari passu*, returning to the House as one measure, which he hoped would pass during the present session. When that result is achieved, we shall at last have order in place of chaos in our Factory Act system.

The second reading of the London Water Purchase Bill was rejected by a majority of 77, the figures being 253 against 176. The Bill was the same as was introduced last year, which met with a similar fate—to empower the London County Council to acquire the undertakings of the London water companies. With regard to its essential principle, the necessity of purchase, there was little difference of opinion. Mr. Long frankly admitted it; and, further, that purchase could not be delayed. The crux of the whole question is as to the purchasing Authority. The promoters of the measure held that the County Council had obtained at the last election a clear mandate on this question from the municipal ratepayers, and the Council was practically unanimous on the subject. But Sir F. Dixon-Hartland and others doubted if the victory of the Progressives could be construed into a mandate that the County Council should buy out the water companies; for other factors, such as dissatisfaction with the new regulations proposed by the companies, were at work at the time. The proposals in the Bill are directly in the teeth of the recommendations of the Royal Commission that the London County Council should *not* be the purchasing Authority, which should be a permanent and not a fluctuating body, and should adequately represent those districts of supply outside the London County Council area. This outside area represents a population of about a million and a-half, with a large number of Urban and Rural District Councils, and they are entitled to be represented on the Water Board. Mr. Long, on behalf of the Government, stated that they were alive to the necessities of the situation, and he was preparing a measure, which he hoped to

introduce next session, based on the recommendations of the Royal Commission, creating a statutory Authority representative of the whole area concerned, giving proper representation to London as well as the outside districts, with a scheme of purchase just to sellers and buyers alike. Much, therefore, as we should wish to see this pressing question settled this year, we must be content to wait one year more, in the hope that the settlement of the London water question will then be satisfactory and final.

We have included the "Pure Beer" Bill among the measures affecting the public health, for such it was claimed to be by its advocates, but we are doubtful of the justice of the claim. It seems to be really a measure brought forward in the agricultural interest, in order to stimulate the manufacture of beer from malt and hops. It does not, as its predecessors have done in the past, propose to prohibit the manufacture and sale of beer made with substitutes, but seeks to divide beer into two kinds —"malt beer," and "part malt beer," to enable the consumer to know what he drinks. The recent epidemic of arsenical poisoning was, of course, founded on in support of the Bill, though unwarrantably, as the whole questions relating to it are at present *sub judice*. In any case, whatever precautions the Commission of Inquiry may recommend to safeguard the purity and wholesomeness of beer, this Bill will not afford the necessary protection. It would give us no guarantee of purity. Sir Michael Foster, the one scientific expert who took part in the debate, condemned the measure, which he held to be retrograde, and as it was also opposed by Ministers and ex-Ministers on both sides of the House, we hardly think it probable that the largeness of the majority with which the second reading was carried should ensure eventual success.

An Evil Spirit at the Cape.

A CUTTING has been sent to us from the *Cape Register*, which shows something of the spirit existing between some of the whites in that country and the Kaffirs. We boast at home that everyone under the Empire flag enjoys perfect freedom, and that the colour of a man's skin makes no difference to his liberty and equality. But the following extract gives another side to the story: "Another evil," says the writer, "demanding immediate remedy is the travelling of natives in the electric tramcars. They should be bundled out, neck-and-crop, and compelled to confine themselves to open cars placed at their disposal by the company. We have no hesitation in saying that the presence of filthy, evil-smelling Kaffirs in the cars is, at a time like this, a source of danger to the white population, and should be prohibited, if necessary, by the Government. The company, doubtless for financial reasons, refuse to take any steps in the matter. At all events, they have refused hitherto. That being so, some pressure should be brought to bear. We have always contended that in any circumstances the presence of the Kaffir on the tramcars with whites is highly undesirable; in existing circumstances it is positively criminal." If this is to be the spirit of the new rule in South Africa, it bodes no good for the future. The poor Kaffirs may be backward in their ideas of cleanliness and other advantages of civilisation, but it is our mission to lift them out of their darkness, not to revive the worst form and spirit of the old slavery days. People who deal with "natives" after the spirit shown in this deliverance are often little better in their habits than those they denounce. They pollute the atmosphere — both moral and physical—and are quite as unfitted for refined society as the poor black just emerged from the dark forest.

Cremation in Canada.

A MONTREAL telegram announces that Parliamentary sanction has been given to cremation in Quebec, and as it is claimed that the Legislature of Quebec is the first British Parliament in the world to enact measures authorising cremation, the announcement is of great interest. The enactment does not, however, appear to have been a general one. It arose under special circumstances. Sir William Macdonald recently presented a crematorium to Mount Royal Protestant Cemetery. Under the Act of Incorporation by the Legislature of Quebec, it is stated, the management of the country was compelled to procure the sanction of the Legislature before accepting the gift, and this was accordingly done. The circumstance derives additional interest from the fact that the large proportion of the inhabitants of Quebec are Roman Catholics, whose Church is opposed to cremation. But many of the Roman Catholics supported the measure on the ground that Protestants were entitled to cremation if they wished it. The result was the adoption of the Bill, after a keen fight, by a majority of one, the opposition, we gather, being solely dictated by religious motives.

Sanitary Progress in Australia.

NOTHING is more marked than the great advance taking place in sanitary matters in the newly-established Commonwealth of the Southern seas. The various colonies are exceedingly watchful of each others' doings, more especially since the outbreak of plague last year. Melbourne and Sydney have recently been criticising each others' methods of street scavenging. According to the latest advices, Dr. Gresswell, the chairman of the Melbourne Board of Health, thoroughly endorses the opinion of the Mayor of Sydney that the Melbourne system of clearing away garbage is in such a primitive state as to compare very badly with the Sydney method. Even before the plague broke out, says Dr. Gresswell, the disposal of garbage was carried out much more effectively in Sydney than ever it has been in Melbourne. The complaints regarding the Moore Park tip were justified, but that rubbish ground was a sanitary paradise compared with the promiscuously selected depositories in Melbourne for the raking of streets and back yards. "In Melbourne," says

the Doctor, "one never knows where next his nostrils will be assaulted by the odour of collected city filth. I used to take a constitutional across Prince's-bridge and along the Domain-road, but as the vicinity has been made a dumping-ground for a mass of decadent matter I have given up my morning stroll." The method of picking up the street garbage in Melbourne is, according to Dr. Gresswell, slovenly in the extreme, and he agrees with the Mayor of Sydney that the wooden Corporation carts are old, dirty, and defective. He pronounces the entire scavenging system virtually useless. The people of Sydney, he adds, can in sanitary matters give lessons to the people of Melbourne. The Mayor of Sydney's criticism of Melbourne's method of dealing with street garbage is regarded by the Mayor of Melbourne as rather sweeping. Melbourne, he says, is doing what Sydney is proposing to do, and for some time past most of the offensive portion of the street garbage has been treated at the Corporation destructors. A sum of £20,000 has been ear-marked for the purpose of an extensive destructor plant, and the Council will then be in a position to similarly treat the whole of the refuse. This is the kind of warfare we delight to see—a desire to excel in all matters relating to public health.

The Plague at the Cape.

The latest telegrams from the Cape state that the plague is assuming a grave aspect. The proportion of cases among Europeans is increasing, and several cases have occurred among the troops. The difficulty with the Malay population has not yet been tided over, notwithstanding the support which the Government have received from the priests. There is a strong party of irreconcileables who are being humoured as far as possible, but who, it is feared, may have to be dealt with by force if they continue to hamper the restrictive measures. These Malays, who number many thousands, are, it appears, descendants of people banished by the Dutch from Java and Sumatra, and held as slaves by the Cape Boers until their emancipation by the British Government. They are said to be industrious, law-abiding, and loyal subjects, puritanical Mahommedans in regard to ablutions, prayers, and other observances, although they are no polygamists, and giving their women the freedom of Europeans. They are clean in person and in their houses, and in this respect present a great contrast to the Kaffirs. It is suggested that their present alarm must be due to the fact that many of the Kaffirs, who were expelled to be placed in the Government locations, were tenants of theirs, for the Malays own a great deal of house property in Cape Town, much of it, no doubt, of the poorest class.

Fortunate Swansea.

It is not often that a public body comes out of a dispute with contractors in the satisfactory way to itself that the Swansea County Council has in the disagreement over the Cray Waterworks contract. The points at issue between the Council and Messrs. Patterson related to certain preparatory work and extras in connection with the reservoir. The claim sent in for these amounted to over £88,842, and it is not surprising that the Council resisted so large an addition to the original estimates, and got the matter referred to arbitration. The case came before a specially constituted Board last June, when the counsel for the contractors desired to go to the Divisional Court, and this was done, with very favourable results to the Corporation, for the contractors amended their claim to £66,593 16s. 8d. The matter then went before the Arbitration Board, and counsel for the contractors here decided to further reduce their claim to £29,750. Upon this amount the claim was met on every single point, and great credit is due to the Town Clerk for the way in which he instructed counsel. It was reported at the last meeting of the Council that in the end the award amounted to £3788 17s., out of which the Corporation had already allowed £2886 3s., so that the amount now due to the contractors was only £902 14s. 1d. We have no doubt that the contractors are now very sorry that they put forward such an excessive claim in the first instance. Had they been more reasonable they might have got more. As it is, Swansea should be proud of its Town Clerk, who has shown such skill in combating the claim.

"Heterodoxy" at Haslingden.

As we read a passage in the annual report of Dr. Harrison, of Haslingden, we think we are back in the days of our grandparents, when people believed that every child born into the world must have whooping-cough, measles, and scarlet fever. It may be perfectly true that it is better for an individual to have any or all of these diseases in early years, rather than wait till life is matured. But it is another thing for a Medical Officer of Health to put in his annual report that he "is strongly of opinion that the very best thing to happen to a person is to have scarlet fever while a child, and whilst life is not of the same vital importance as when the person has become a parent. So long as a person has not had the disease he is liable to contract it when exposed to infection, and as a general rule children have it in much milder form than adults and are more likely to recover from it." This is a very innocent-looking opinion, but when circulated broadcast through the Press it may become very harmful. It is calculated to make people careless about their children, and tends to admit the claim that "you are bound to have these diseases." We are quite sure that Dr. Harrison does not mean to imply this. Such an admission would carry with it the belief that all the efforts of a "preventive" character were in vain and so much wasted energy. We are not prepared to admit anything of the kind, and we are too conscious of the after effects of these diseases—to take that ground alone—to cease our efforts in impressing upon people the importance of waging an incessant warfare against zymotic disease of every kind.

The Medical Council.

The provisions of the Medical Council Act of 1858 stipulate that the General Medical Council shall annually inform Parliament what are its receipts and expenditure as well as those of the branch Councils for England, Scotland, and Ireland, and also of the apportionment of the amounts payable to the General Council by branch Councils. A return giving this information for 1900 has just been laid on the table of the House of Commons. The revenue of the General Council was benefited to the extent of £45 10s. during the year by the sale of 201 copies of the *Medical Register*, and £17 10s. 3d. came from the sale of "other publications." Four foreign medical titles realised £8, and seven colonial medical qualifications at £5 each brought in £35. The contributions to the General Council by the branch Councils were as follows:—English Branch Council, £4491 14s. 1d.; Scottish Branch Council, £2718 15s. 10d.; Irish Branch Council, £874 0s. 1d. The total income of the Council for the year was £8543 1s. 1d. Taking the General and branch Councils together, it appears that while the total receipts amounted to £11,956 5s. 3d., the total expenditure for the year was £9910 12s. 2d. The fees and other expenses of the General Council absorbed £3459 10s., while the Council's printing account amounted to £1127 8s. 10d. On December 31st last a sum of £1552 13s. 1d. stood to the credit of the English, Scottish, and Irish Branch Councils. In the course of the year a grant of £500 was made to the Irish Branch Council.

MUNICIPAL ENGINEERING & SURVEYING.

CROSS-TABLE CHAT.

There is no municipal engineer who can afford to lose any opportunity of enhancing his knowledge of the properties and characteristics of limes, mortars, and cements, and I venture to believe that the little book, "Lime, Mortar, and Cement; their Characteristics and Analyses, with an Account of Artificial Stone and Asphalt," price 5s., by W. J. Dibdin, the well-known analytical chemist and author of "The Purification of Sewage and Water," will be warmly welcomed and appreciated by them, as it contains such a storehouse of original information which cannot be found elsewhere, and which is so essential for their use.

Mr. Dibdin, in his practice as an analytical and consulting chemist, is frequently concerned in the analyses of mortars and cements, and in legal proceedings arising from the use of improper mortar by builders, and his opinions and suggestions are therefore of especial value. Surveyors cannot make chemical analyses, and if they did so they would have no weight in a Court of law against properly-qualified analysts, but they should be able to determine by ordinary physical and simple tests the composition of mortar and the impurities contained in it, which Mr. Dibdin so well advises them how to do in his book.

The weakness of the clause in the Model Bye-laws of the Local Government Board relating to mortar is manifest on a study of this book. The bye-laws of the London County Council, made under Sec. 16 of the Metropolis Management and Building Act, 1878, are more specific, and provide that the mortar used under this Act must be composed of freshly-burnt lime, and clean, sharp sand or grit, without earthy matter, in the proportions of one of lime to three of sand or grit. This may be compared with the Model Bye-laws, which prescribe that walls shall be "properly bonded and solidly put together with good mortar, composed of good lime and clean, sharp sand, or other suitable material."

Now, under this clause, there is no restriction that the lime shall be freshly burnt—a most important omission—which enables old mortar to be worked in; nor as to the character or quality of the lime as regards its causticity.

In some parts of the country there is a tendency on the part of speculative builders to use road sweepings in lieu of sand, and also burnt clay ballast, as complying with the requirement of the clause, which allows "other suitable material" than sand to be used. The clause should prohibit the use of organic and earthy matter—the former of which is found in road sweepings, and the latter in improperly-burnt ballast. The observations of the author on the subject, and the methods for detecting the presence of these unsuitable materials, should be known to all surveyors.

I learn that the Royal Commission on Sewage Disposal, appointed in May, 1898, are still unable to state with any degree of precision when their investigations will be completed, inasmuch as some of the questions submitted to them can only be determined after prolonged scientific investigation and inquiry. The secretary of the Commission—Mr. F. J. Willis—has reported to the Treasury that the Commission had held fifty-two meetings, had taken the evidence of eighty-seven witnesses, and visited twenty-two sewage works, and that a large number of chemical and bacteriological investigations in relation to sewage disposal had been made by experts, and that a systematic examination of the results of land treatment of sewage was being carried out. As a matter of fact, Dr. Houston, the well-known bacteriologist, who has been closely associated with the bacteriological experiments which have been conducted for the London County Council at the Barking and Crossness sewage outfall works, has been engaged for more than a year in an elaborate investigation into the character, from a bacteriological point of view, of effluents from sewage after land treatment.

The results of these experiments should be of very considerable interest. It has been shown that effluents from bacterial processes of sewage treatment contain a very large number of bacteria. Some opponents of the system attempt in consequence to depreciate the system, whilst adherents of it claim that the percentages of such bacteria are beneficent, and that they continue actively to increase the purification of the effluents after they have left the bacteria beds. That these micro-organisms play an important part in nature is common knowledge to every thoughtful man now-a-days. It is significant that fresh air contains a greater number of micro-organisms than sewer air, but it does not follow that as a consequence the latter is the ideal atmosphere in which to live, and by a similar deduction it may be found that the pressure of micro-organisms in bacterial sewage effluents is one of nature's own methods, and their absence would be prejudicial. Such micro-organisms are absent in chemically-treated effluents, which are well known to be unsatisfactory and liable to putrefaction. To what extent they exist in effluents from land treatment has not yet been shown, and it is largely on this account that Dr. Houston has been authorised by the Royal Com-

mission to conduct the experiments on such effluents These experiments are not yet concluded, but the results when published must inevitably be interesting.

It is not generally known that surveyors can conduct levelling operations over a tract of country or over roads and ascertain the distance by means of an ordinary levelling telescope and surveying staff without chaining, and as I have been asked to advise on the subject I would point out that Mr. W. H. Wells, the author of the system known as the "Wells" system, has published a pamphlet on it at the price of 1s. This pamphlet fully and clearly describes the simple system. It is also particularly applicable for ascertaining the breadth of large rivers and other obstacles on or off the survey line to be read without measurement.

I understand that the Septic Tank Syndicate, Limited, have declared a dividend of 2½ per cent. on the results of last year's working. This is not quite so good as was expected. The company have at the present time, I am informed, a considerable amount of important work in hand. Senex.

National Health Society.

OFFICIAL TRANSACTIONS.

Training Lectures.—There will be no lectures held at Berners-street during Easter week. The training class will meet again on Monday, April 15th, at 4 p.m., when Dr. Kenwood will give the eighth lecture of his course on "Public Health." On Tuesday, April 16th, Dr. Squire will resume his lectures on "Human Anatomy and Physiology."

We have received the following satisfactory report of the Society's work in Lincolnshire during the past year. "Miss Morgan has given 100 lectures on 'Nursing, Health, and First Aid,' and the interest has been well maintained. Several new centres were started in the spring, notably Market Rasen and Hatton, and the application for a second course in both places within the year was granted by the County Council. In each of the twenty centres an examination was held with most gratifying results to both secretaries and lecturer. It was thought desirable as a further test that a change of examiner should be requested, with the result that an equally large number passed the required examination and gained certificates. The people work really well themselves, meeting in each other's houses for practising and questions, in addition to the weekly lectures and classes."

A very satisfactory examination on "First Aid" was held at Monmouth, on March 28th. The examiner speaks most highly of the work of the candidates, and particularly mentions that the "*vivâ voce* was excellent." Eleven candidates presented themselves, and all have been successful in passing the required standard, the lowest candidate on the list scoring 62 per cent. marks.

The Finance Committee of the Birmingham, Tame, and Rea District Drainage Board reports that it has obtained from the United Kingdom Temperance and General Provident Institution an offer of loans of £42,200 and £7321 at 3¾ per cent. interest for thirty years and forty-five years respectively, being the periods sanctioned by the Local Government Board. The loans are to be repaid by equal annual instalments of principal and interest. The loan of £42,200 is for the construction of the filter beds at the Saltley Works, and the loan of £7321 is for the purchase of the land at Walmley Ash.

Public Works.

SEWERAGE.

The Barrow Rural District Council has accepted the tender of Messrs. H. H. Barry for work at the Birstall sewage works, at £2955.

The Nottingham County Council has decided to lay a new sewer along Nottingham-road, at a cost of £3000, before the proposed tramway is laid.

The Withington Urban District Council intends applying for a loan of £20,000 for sewerage and drainage works at Whalley Range and Chirlton.

The Local Government Board has written the Hungerford District Council, stating that an inquiry will shortly be held into the Council's application to borrow £5812 for drainage purposes.

A meeting of the Scone Drainage Committee was held in the County Buildings, Perth last week, when Mr. Commin, engineer, Exeter, of the Septic Tank Company, explained the system as proposed, to the satisfaction of the Committee.

The Local Government Board has written the Antrim County Council, stating that it has recommended to the Commissioners of Public Works the loan of £1000 sanctioned for the construction of bacteria beds at the Holywell County Asylum for the purfication of sewage.

The Local Government Board has written the Fylde Rural District Council stating that an inquiry will be held shortly with reference to the application of the Council for sanction to borrow £13,900 for purposes of sewerage and sewage disposal for the townships of Bispham, with Nonbrech and Carleton.

Mr. H. Percy Boulnois, one of the Local Government Board Inspectors, recently held an inquiry at Tunstall, into the Urban District Council's application to borrow £2500 for sewerage works. The amount is required for works to deal with the Pittshill district, which has recently been annexed by Tunstall. When the new sewerage scheme for Tunstall, now in course of being carried out. was contemplated, the plans were prepared with a view to sewering Pittshill in case of it being annexed. There was no opposition to the application, but the Inspector intimated that he did not think the Local Government Board would sanction the loan until certain works included in the Tunstall sewerage scheme were concluded.

An interesting installation for purifying the sewage, slops, and refuse liquids from a country house in North Devon, designed by Mr. A. S. Goodridge, A.R.I.B.A., of Bath, has recently been put into operation, the analytical figures showing remarkable results, the effluent from the polarite beds being reported upon by the City Analyst as follows:—"I hereby certify that having analysed a sample of water received on the 4th day of January, 1901, from Mr. A. S. Goodridge, I find the same to contain the following:—Free ammonia, none; albuminoid ammonia (grains per gallon), ·0028; oxygen required to oxidise decomposing matters, none. This is a pure sample of water, no hesitation need be felt in using it for domestic purposes. It contains very small traces of soluble organic matter." These results were obtained by an oxidising bacterial bed composed of coke, sand, and 8in. of polarite, the crude sewage having been merely passed through strainers and an open innoculation tank. It is all disposed of before any putrefaction takes place. The treatment, it will be seen, is of the simplest kind, the use of polarite enabling the sewage at a trifling expense to be converted into practically "pure water."

The Doncaster Rural District Council has decided to apply to the Local Government Board for sanction to a loan for £11,725 for works of sewerage and sewage disposal for the towns of Conisburgh and Denaby, with a population of 16,000. The scheme comprises main and outfall sewers for the towns, also underground storage tank, with a capacity of 80,000 gallons, engine-house, duplicate engines and pumps, bacterial tanks, and laying out of land from the design of Messrs. D. Balfour and Son, of London and Newcastle.

Colonel Durnford, R.E., held a Local Government Board inquiry at New Mill, near Holmfirth, on Wednesday in last week, into the application of the New Mill District Council for sanction to borrow £12,550 for a scheme of sewerage and sewage disposal. Mr. Sam Shaw, C.E., of Dewsbury (the Council's engineer), and the Chairman and Clerk gave evidence. Mr. Jas. Sykes, solicitor, Huddersfield, opposed on behalf of Mrs. Broadhead, an adjoining owner, on the ground that the outfall works would depreciate the value of her property.

Falmouth Corporation has not yet overcome the difficulty of making a final selection from the many drainage schemes submitted to it in competition, by engineers throughout the country. The General Purposes Committee—who are the Corporation sitting in private—have just been engaged in further discussions on the subject. At the first of these meetings they received additional reports from Messrs. Richardson and Le Maitre, and Messrs. Pollard and Tingle (two of the competing firms), as well as a letter from Mr. Valon, C.E. Then there was an adjourned meeting, which resulted in the formulation of a report for submission to the Corporation last week. That report contained the recommendation that a letter be sent to Mr. Brereton, C.E. (who has been appointed umpire), asking if he can lay before General Carey the schemes marked "Automatic" and "Gravitation No. 2," and ascertain from him the attitude of the Local Government Board towards them, and which they would prefer. This recommendation was finally agreed upon by the members.

Dr. Clibborn, Medical Inspector to the Local Government Board, and Mr. P. C. Cowan, M. Inst. C.E., Chief Engineering Inspector to the Board, held an inquiry in the Memorial Hall, Newcastle, co. Limerick, last week, into a complaint received under the Public Health (Ireland) Act, to the effect that the Kilkeel Rural District Council, the Sanitary Authority, had made default in providing Newcastle with sufficient sewers. Colonel Slacke having been examined, Dr. Magill, Medical Officer of Health for Newcastle, was examined as to the state of the sewerage in the town. He strongly condemned the existing sewers, with very few exceptions, and emphasised the necessity for the Council adopting a sewerage scheme, his preference being for a bacterial system of treatment. Mr. J. Findlay Peddie, C.E., gave evidence as to the particular nuisance complained of by Colonel Slacke, and also corroborated the previous witness's evidence as to the want of proper sewerage in the town. Mr. M'Cartan, in explaining the position of the Council in the matter, said they admitted that sewers might be necessary in certain cases, and they were quite prepared to provide them, but they declined to embark upon any sewerage scheme involving a large expenditure, particularly if the area of charge was to be the whole rural district. Evidence on behalf of the Council was given by Mr. Thos. Graham, Clerk of the union, and Mr. Matthew King, chairman. The latter said the Council were willing to carry out a fair system of sewerage for Newcastle, but they held that it would be unreasonable to ask the whole division to bear the expense of an enormous scheme. They admitted that something should be done to improve the sewerage of the town.

The Castle Ward Rural District Council has approved of the sewerage and sewage disposal scheme for Dinnington colliery prepared by Mr. Harry W. Taylor, A.M.I.C.E., of Newcastle-on-Tyne and Birmingham, and application has been made to the Local Government Board for borrowing powers for £2000. The sewage will gravitate to the outfall and be treated bacterially.

A special meeting of the Rochdale paving, sewering, and scavenging Committee was held recently to consider the proposed extension of the Corporation Sewage Works. There was laid before the Committee a scheme comprising a considerable extension of the present works. We understand that the scheme is on the lines of the bacterial system, and will if carried out necessitate an expenditure of over £30,000. The details of the scheme are under consideration, and nothing has as yet been decided upon.

WATER.

The Ashbourne Rural District Council has engaged Mr. Harry W. Taylor, A.M.I.C.E., of Newcastle-on-Tyne and Birmingham, to prepare a scheme of water supply for Kirk Ireton.

The well which has been in course of construction for the Portishead District Water Company is now nearing completion, and to mark the occasion the whole of the workmen have been entertained to dinner at the Priory Hotel by Mr. John Curtis, the energetic manager of the water company.

At the last monthly meeting of Sleaford Rural District Council, Mr. J. Clare submitted a scheme for supplying Digby with waterworks at a cost of £3207, which was adopted. Owing to the scarcity of water at Scredington, it was resolved to cut off all supplies for stock, and only to allow it to be used for domestic purposes.

Mr. M. K. North, C.E., an Inspector of the Local Government Board, visited Newbiggin last week and examined the existing sources of supply, and also viewed the route of the water mains, &c., proposed for the new water supply for the town, which the Council has adopted, as designed by Messrs D. Balfour and Son, civil engineers, including the source of supply with site of additional storage accommodation.

There were 2,672,448,000 gallons of water in the Edinburgh reservoir last week. The total delivery per day during the fortnight ending March 26th was 16,563,000 as compared with 16,546,000 per day during the fortnight ending March 12th. The rainfall at Glencorse since January 1st has been 6·67in., as compared with 11·55in. last year. The rainfall at Gladhouse for the same period has been 5·86in., as compared with 10·57in. last year.

At the meeting of the Barry Gas and Water Committee last week, Mr. E. W. Waite, the Water Engineer, reported that during February the consumption of water by the town was 16,141,700 gallons, the average per day being 555,050 gallons, or 18¼ gallons per head of the population. This is a slight increase on the corresponding month of the previous year. The rainfall for the month was 0·86, a great decrease on the average for the last thirteen years.

At the last meeting of the Upper District Committee of Renfrewshire, it was remitted to a sub-committee to consider and report regarding a water supply scheme for Giffnock and other districts, the area to be included, the estimated cost of capital works and annual outlay, the annual valuation and probable rate of assessment involved, and also as to the probable cost of obtaining an Act of Parliament of the Provisional Order for the providing of a supply of water from the Black Loch in the parish of Mearns.

A MEETING of the Queenstown Council was held last week to confer with the engineers as to the earliest possible date upon which they hoped to be in a position to furnish the Local Government Board with the plans, specification, and estimate in connection with the completion of the waterworks at Tibbetstown, and for the extension to Haulbowline, for which works the Council has applied for a loan of £10,000.

AT its last meeting the Water Committee of the Liverpool City Council agreed upon a recommendation to the Council that a piece of land in St. Helens-road, Eccleston, near Prescot, with the beerhouse known as the Sun Inn, be purchased from Messrs. Greenall, Whitley, and Co., Limited, St. Helens, for the sum of £1000, the Corporation to pay the vendors' solicitors' costs (including negotiation fee) and surveyors' charges. The land is required in connection with the Committee's works.

THE monthly report on the composition of Loch Katrine water, prepared by Professor E. J. Mills, D.Sc., F.R.S., Glasgow and West of Scotland Technical College, has been issued. The results are returned in parts per 100,000. Total solid impurity, 2·500; organic carbon, 0·223; organic nitrogen, 0·027; nitric nitrogen, 0·001; ammonia, 0·000; total combined nitrogen, 0·028; chlorine, 0·72; hardness, 1·27; temperature 5·8 deg. Cent. (=42·4 deg. Fah.) The water was sampled on March 15th. It was light brown in colour, and contained a little suspended matter.

THE Wellington Board of Guardians has given notice to the Wellington Urban District Council that it claims a supply of water for the workhouse on the basis of rateable value as charged to other consumers instead of paying by meter, as hitherto. The claim of the Guardians is based on a case decided in the Court of the King's Bench, in which it was held that the Liskeard Workhouse was entitled to a water supply as for domestic purposes. It is estimated that on the rateable value principle the Guardians would pay two-thirds of what they have hitherto paid. The Urban Council has decided to take counsel's opinion.

THE Bill of the Derwent Valley Water Board came last week before a Select Committee of the House of Commons, presided over by Colonel Welby. The Bill is to empower the Joint Water Board to construct a new railway and to alter a reservoir in the valley. Mr. Balfour Browne, K.C., opened the case for the Bill. Alderman Gainsford (of Sheffield), chairman of the Joint Water Board, and Mr. Edward Sandiman, Engineer, gave evidence in support of the Bill; and Alderman Roberts, ex-Lord Mayor of Sheffield (who was unable to attend afterwards), was examined against the Bill, and spoke of the strong feeling in that city against any interference with the scenery of the valley. The Committee adjourned.

A LECTURE on the Glasgow water supply was delivered by James B. Wylie, A.M.I.C.E., to the Technical College Scientific Society recently. In introducing his subject the lecturer referred to the time when water was sold on the streets of the city at one halfpenny per stoup, and to the days when Clyde water was used for domestic purposes. Passing on to speak of the aqueducts at present in use for conveying the water from Loch Katrine to the reservoirs, Mr. Wyllie minutely described the method of setting out the tunnels by means of observatories placed at the centre of each straight section. The operations of boring and blasting were also explained, and diagrams exhibited showing the sections of the tunnels at various places and the route of the new aqueduct from Loch Katrine. At the close of the lecture a number of slides illustrating the works in progress and the reservoirs of Mugdock and Craigmaddie were thrown on the screen.

AT a meeting of the Dalton Urban District Council last week, the Parliamentary Committee reported that the requests made to the Barrow Corporation for certain privileges in connection with Barrow's water scheme had been refused. Mr. Hamer said he thought this was due to the fact that the Dalton Council was not in a position to fight the matter. He thought the Barrow Corporation had withheld its reply to Dalton until it was too late for the latter to appear against the Bill. No action was decided upon.

LAST week the Select Committee of the House of Commons, of which Mr. Schwann is chairman, commenced consideration of the Tees Valley Water Board Bill. Mr. Balfour Browne, K.C., for the promoters, this was a Bill to confer further powers on the Tees Valley Water Board in relation to the supply of water. He proceeded to explain the circumstances which had led up to the formation of the Board in 1876 by the Local Authorities of Middlesbrough and Stockton, and subsequently of Thornaby, Middlesbrough being interested to the extent of six-twelfths, Stockton five-twelfths, and Thornaby one-twelfth. When the Grassholme reservoir, now under constuction, was completed, the total supply of the company would be 194,568,000 gallons per week, and by that time the consumption, it was estimated, would be 100,000,000 gallons, so that there would be a margin of 94,568,000 gallons a week. It was to enable them to dispose of this margin to anyone who might want it that the present Bill was promoted. Mr. Wilson, general manager of the Tees Valley Waterworks, gave evidence in favour of the Bill, and was still under examination when the Committee adjourned.

LIGHTING.

A LOCAL Government Board inquiry was held at the Town Hall, Newport (Mon.), last week into the application for sanction to borrow £28,000 for electric lighting and £1800 for widening the roads.

THE London County Council has agreed to lend the Hackney Borough Council £30,000 for an electric light installation, the Hammersmith Borough Council £13,530 for the same purpose, and the Stepney Borough Council £5163 for street lighting.

THE Bombay Corporation has empowered the Commissioner and a Committee, subject to compliance with certain specified conditions, to make arrangements with the Pioneer Electric Light and Power Company of London to work the two concessions of the tramways and the electric lighting.

THE Electricity Committee of the Poplar Borough Council has decided, subject to the approval of the Council, to light the Isle of Dogs with the electric light. It is estimated that 100 arc lamps will be required, at an estimated cost of £3277, while the additional charge per annum in excess of the cost of gas lighting will be £877.

A CURIOUS state of affairs has, we understand, arisen in the City owing to the recent decision in the Court of Appeal regarding the invalidity of certain contracts that were entered into some years ago between the late Commission of Sewers and the City of London Electric Lighting Company. The secretary to the company has addressed a letter to the Corporation pointing out that under the recent decision the contracts for the central and western districts are null and void, the consequence being that those agreements between the company and the Corporation as to the supply of electrical current have ceased to exist. In the circumstances the company ask whether the Corporation wishes the public supply continued, and suggest that a small committee should be appointed by the Corporation to discuss the terms for its continuance.

We understand that, as predicted by the Town Clerk at the meeting of the Gravesend Council last week, a settlement has been arrived at with regard to the objections to the parliamentary Bill of the Gravesend Gas Company. The Bill has been considered by a Parliamentary Committee and approved, subject to amendment which the promoters agreed to in order to compromise with the Gravesend and Northfleet Councils as objectors. The terms of the compromise will be duly reported to the respective Councils.

The annual meeting of the Shirebrook and District Gas Company was held last week at Nottingham. The directors' report stated that the necessary Act of Parliament having been obtained, the company was now proceeding with the business for which it was formed. It also stated that of the £16,000 ordinary stock which is now being issued, over £14,000 had been privately subscribed, and applications were being received daily. The laying of the mains and erection and equipment of the works will be proceeded with immediately. The Board anticipates that it will be in a position to supply gas for next winter's consumption.

The report of the Commercial Gas Company for the half-year ended December 31st, 1900, states the net profit at £39,658, making, with £35 received for interest, £39,693. Deducting therefrom £5699 for interest on debenture stock, there remains standing to the credit of the net revenue account a balance of £33,994 available for dividend. The directors recommend the payments of dividends at the rates of 12 per cent. per annum on the old stock of the company, and of 9 per cent. per annum on the new stock. The amount by which the profits of the company are insufficient to pay the dividends will be taken out of the reserve fund.

Since Peebles Corporation took over the gas company's undertaking, the consumpt of gas has greatly increased, and it has been found that the present works were too small for the requirements of the town. The Town Clerk has been instructed to write to Messrs. J. and F. Anderson, W.S., Edinburgh, for the purpose of ascertaining if they would be willing to feu a piece of ground about a mile to the east of Peebles, on the Innerleithen-road, as a site for the proposed new gasworks. Provost Ballantyne has also been requested to ascertain from an electrical engineer if water-power could be used in the event of electric light being introduced.

The Colwyn Bay Urban District Gas Bill came before a Select Committee of the House of Commons last week. The Bill is promoted by the Urban District Council of Colwyn Bay to enable it to acquire the undertaking of the Colwyn Bay Gas Company. In stating the case for the Bill, Mr. Baggallay said the Bill was promoted by the District Council for the transfer of the Colwyn Bay and District Gas Company's undertaking to the District Council. The Committee, he said, would not be troubled with any question as to whether there should not be a transfer—that had already been dealt with under a Bill. The preamble of the Bill was finally proved.

Mr. Frederick Punchard, of Kirkby Lonsdale, the umpire in the arbitration proceedings between the Ossett Corporation and the Ossett Gas Company, for the compulsory purchase of the works and undertaking of the company, gave his award last week, and it amounts to £97,500. The Corporation also takes over a mortgage of £7000. The share capital of the company amounts to £43,000, of which £15,000 carries 10 per cent. and £28,000 7 per cent. The shareholders will receive a little over 28 years' purchase of the maximum dividends. The company's valuers claimed £117,110, and the Corporation is understood to have offered £87,000.

The Bill promoted in Parliament by the Honley Urban District Council for taking over the Honley Gas Company's undertaking has passed the Committee of Ways and Means as an unopposed measure. At the suggestion of the promoters, the Committee struck out the clause relating to the adjustment of charges for penny-in-the-slot meters. The Bill has been sent for third reading.

We understand that Messrs. Siemens and Co., the well-known electrical construction engineers, have completed the purchase of the land at The Hough, Stafford, which they require for the erection of their extensive new works. The negotiations have been completed with Messrs. Hand and Co., through Messrs. E. W. and W. H. Turnor, agents for the owners, the Rev. C. C. Ellison, Sir T. Salt, Bart., and the Grammar School Trustees. The land already acquired comprises about 51 acres, and extends from the Queensville Bridge to the Crinoline Bridge along the east side of the London and North-Western Railway. It is not proposed to interfere with the Stafford Cricket Club ground. The company are now negotiating with Messrs. Turnor for the purchase of a further 10½ acres of land forming part of the Stych Fields, and extending from the Crinoline Bridge to the Talbot and Ingestre roads, and we understand the company propose to erect on this land about a thousand dwellings for the accommodation of their employés. Building operations will, we believe, be commenced very shortly.

GENERAL.

A measles epidemic has led to the closing for a while of Campsbourne Infants' School, Hornsey.

The Beccles Town Council has adopted plans and estimates for alteration of the Town Hall at a cost of £700.

The London County Council has agreed to lend the Lewisham Borough Council £1000 for asphalte paving works.

The Bromley Rural District Council has decided to contribute a sum of £2900 towards the West Wickham sanitation scheme.

Major Slacke held an inquiry at Bingley Town Hall recently with reference to an application of the District Council to borrow £4250 for various works.

The Court of Common Council has decided to contribute the sum of 100 guineas out of the City's cash towards the purposes of the British Congress on Tuberculosis, of which his Majesty the King was, as Prince of Wales, president, and Sir William Broadbent, Bart., F.R.S., is the chairman of the Council, and that the Chamberlain pay the same to the treasurer of the congress.

At the last monthly meeting of the Goole Urban District Council the Highways and Sewers Committee recommended that the scheme of the Surveyor for paving several of the streets of the town with wood and granite setts, at a cost of £13,742, be adopted, and that the Clerk apply to the Local Government Board for power to borrow £12,092 for the completion of the work. The recommendation was adopted.

Mr. William Keith, County Sanitary Inspector, Clackmannanshire, has issued his report upon the sanitary condition of the county and burgh for 1900. Mr. Keith states that during the year steady progress had been maintained in building and repairing houses for the working classes. A good many houses had been erected in the various villages and fitted up with all modern requirements. All workshops had been kept in order. All places of interment were kept in a satisfactory state. Steady progress was being made in the way of providing a purer milk supply.

The making up of private streets in the urban district of Hindley will involve an outlay of £16,000.

The Bedworth Committee of the Foleshill Rural District Council last week presented a report to the latter body on Dr. Bostock Hill's report to the Warwickshire County Council. The Committee stated that there was now a public supply of water, and the Sanitary Inspector was requested to periodically take samples from existing wells. The scavenging was being improved, but the Nuneaton and Chilvers Coton District Council had complained of the discharge of sewage into the river Anker from Bedworth. The report was adopted by the Council.

We understand that an important movement is on foot at present with regard to insanitary dwellings in Perth. The question has been raised by a number of gentlemen much interested in the matter, and certain steps have already been taken in the scheme. It is alleged there are a large number of insanitary dwellings in Perth, and as the Local Authority has power under the Act to compel landlords to put these houses into a fit sanitary condition, these gentlemen intend to insist on the Local Authority using its power, and should the Local Authority fail to do so the matter in all probability will be laid before a higher authority. The scheme promises to be an extensive one, and a meeting will in all probability be held at an early date for the purpose of electing a Committee thoroughly representative of the working classes. It is proposed to ask the co-operation of all friendly societies and organisations interested in the working classes.

Under the Cleansing of Persons Act, Marylebone Borough Council now provides hot baths and accommodation for the simultaneous disinfection of clothing for persons of both sexes, but during the past year a much smaller number of women than was expected have taken advantage of the provision. The number is, however, gradually increasing. During the past twelve months 3352 men and 28 women underwent the cleansing process, and had their clothes disinfected. A considerable number of these poor people, says the Medical Officer of Health, were in a most offensive condition, swarming with parasites, and generally in a deplorable state—so much so, that they would have infected any public seat or conveyance they made use of. The great majority of the applicants for the cleansing process came from the Salvation Army Home in Burne-street, showing the good influence the authorities at this home exercise on the poor people for whom they provide, in instilling in their minds the necessity of cleanliness.

At last week's meeting of the North Dublin Union the clerk stated that Dr. Edgar Flinn had been asked by the Local Government Board to make a report with regard to matters relating to the public health of Howth. The report, which was called for owing to the prevalence of diphtheria, had been sent on to the Council by the Local Government Board. It contained a number of suggestions made by Dr. Flinn, among which were the provision of a properly devised plan of sewerage and drainage; healthy dwellings for the labouring classes were urgently needed, accompanied by a strict enforcement of the law as to the closing of houses that had been condemned as unfit for human habitation; an improvement in the system of public and domestic cleansing, and the more frequent removal of filth accumulations from the backyards of small cabin dwellings was necessary, and house-to-house inspections should be made at regular intervals, as accumulations of house filth had been allowed to remain unremoved for too long a period; cowsheds, dairies, and slaughter yards required inspection; the provision of a disinfecting chamber might be considered by the Council; an estimate should be obtained of the cost of a sufficient supply of good water; the temporary closing of the schools was also suggested owing to occurrence of dipththeria.

PERSONAL.

Dr. J. A. Rees has been appointed Medical Officer of Health for Aberystwith.

Mr. Winton, gas manager for West Calder, has been appointed Manager of the Moffatt Gas Company.

Mr. A. Hodgkins has been appointed Inspector under the Sale of Food and Drugs Act for Henley.

Dr. Hamilton has resigned his position as resident Medical Officer at Smithston Asylum and Poorhouse.

Mr. George Cunningham, jun., has been appointed superintendent of the sewage filtration fields at Denny.

Mr. A. G. Gray has been appointed Sanitary Inspector for Wallingford, at a salary of £25 per annum.

Mr. J. V. Snowden has been appointed Inspector of Nuisances for Tamworth, at a salary of £120 per annum.

Dr. White has been reappointed Medical Officer of Health, and Mr. E. Edwards Inspector of Nuisances for Corwen.

Mr. J. W. Bradley, Borough Surveyor of Wolverhampton, has been appointed City Engineer to the Council.

Mr. R. M. Prescott, Town Clerk of Nelson, has been appointed Town Clerk for the Borough Council of Fulham.

Mr. G. H. Pegram, A.S.I., has been unanimously reappointed Inspector of Nuisances to the Epping Urban District Council.

The Local Government Board has sanctioned the reappointment of Dr. R. T. Richardson as Medical Officer of Health for Trowbridge.

The Local Government Board has sanctioned the reappointment of Dr. A. K. Gale as Medical Officer of Health for the rural district of Norton.

Mr. N. G. Fish has been reappointed Inspector of Nuisances under the Yeovil Rural District Council, at a salary of £70 per annum. He will also act as Petroleum Inspector.

Mr. James A. Budge has resigned his position as Burgh Surveyor and Sanitary Inspector for Buckie, in consequence of his having accepted the appointment of Deputy Road Surveyor for Birmingham, at a salary of £180 per annum.

We regret to announce the death of Dr. W. H. Turnbull, Medical Officer of Health of South Shields, at the early age of thirty-two years. Dr. Turnbull was a native of Houghton-le-Spring, and took the degrees of M.B. and B.S. at Durham in 1890; B.Hy. in 1891; and D.Hy. at Newcastle in 1895.

Sanction has been given by the Local Government Board to the appointment of Dr. W. A. Bond as Medical Officer of Health of Holborn, and Dr. J. J. Allan as Medical Officer of Health of the city of Westminster. It has also confirmed the appointments of the following Sanitary Inspectors:—Mr. J. Johnson, Poplar; Mr. W. J. Storer and Mr. E. J. Dillon, St. Pancras.

It was stated at the meeting of the London School Board last week that the resolution of the Board to increase the salary of its Medical Officer to £800 on condition that he held no other appointment except his King's College professorship has not met with the approval of Dr. William Smith, the officer in question, and he has written stating that he could not accept the increase on the conditions suggested, as it placed a restriction on himself which was not found to apply to any other official in the Board's service. The General Purposes Committee will consider and report on the communication.

The Hornsey Urban District Council has advanced Mr. Lovegrove's salary to £850, to be further increased next year by £50.

Dr. Telfer Thomas and Mr. J. Williams have been re-elected Medical Officer and Sanitary Inspector respectively for Camborne.

Mr. N. W. Hoskins, F.I.S.E., of New Eltham, S.E., has been appointed Lecturer in Sanitary Science at the City of London College.

The Local Government Board has sanctioned the re-appointment of Mr. Fred. Wadsworth as Sanitary Inspector for Holmfirth.

Mr. S. Turner, Surveyor of Brentwood, Essex, has been appointed Surveyor and Inspector of Nuisances for the urban district of Knaresborough, at a salary of £125 per annum.

The Local Government Board has approved the appointment of Mr. F. Halliday, as Sanitary Inspector for the rural district of Castle Donington, at a salary of £45 per annum.

Three names have been selected by the Sanitary Committee of the City of London, from which the Common Council will select an Analyst on the 25th inst. They are:—Dr. M. W. Blyth, Public Analyst to the boroughs of Eastbourne and Brighton; Dr. S. Rideal, vice-president of the Society of Public Analysts; Dr. F. L. Teed, Public Analyst to the boroughs of Islington and Camberwell.

We are informed that Mr. Peter Fyfe, Chief Sanitary Inspector of Glasgow, has a book in hand dealing with the social problem in the various aspects under which it has presented itself to him during his professional career in Glasgow. Mr. Fyfe promises to continue the literary reputation of the Health Department, of which Sir W. T. Gairdner, K.C.B., laid the foundation, and to which Dr. Russell, while Medical Officer of Health, made many notable contributions.

The Sanitary Committee of the City of London met last week, and made a selection of six names to be submitted to the Common Council from which to appoint a Medical Officer of Health for the City of London. The selected candidates are:—Dr. W. A. Bond, Medical Officer of Health to the Holborn Borough Council; Dr. Collingridge, Medical Officer of Health of the Port of London; Dr. Robt. Sydney Marsden, Medical Officer of Birkenhead; Dr. N. C. Pattin, Medical Officer of Health to the Corporation of Norwich; Dr. J. Priestley, the Medical Officer of Health for Lambeth; Dr. F. J. Waldo, Medical Officer of Health for the Inner and Middle Temples, and late Medical Officer for St. George the Martyr, Southwark. The appointment will be made on the 25th inst.

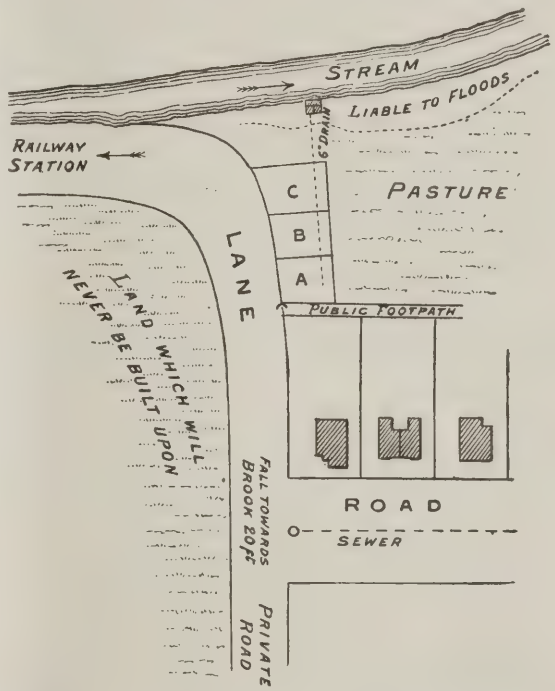
NOTES AND QUERIES.

Subscribers may obtain advice on matters appertaining to Public Health Law and Municipal and Sanitary Engineering. Letters should be addressed "Notes and Queries," The Sanitary Record, 5, Fetter-lane, London, E.C. If an answer be required immediately, a stamped addressed envelope must be enclosed

2134.—Defective Drainage: Proceedings.—"Inspector" writes:—"On testing the drainage of a semi-detached house with the smoke test, smoke was found to exude from some of the joints of the yard paving. Some of the surface traps are D traps cemented down, and resisted the smoke test, consequently no evidence of a defect was found here. The drain pipes are of good 6in. stoneware. (1) Will you kindly advise which is the best section to proceed under when serving notices? I have asked for instructions to serve notices under Sec. 23 of the Act of 1875, to get iron traps replaced with stoneware gullies when they are gas-tight, and when found to leak, under Sec. 94. Is this right? (2) An assistant Sanitary Inspector tested the drainage of a street of houses. The several owners were informed of such intention and the occupiers raised no objections. All the drains were found to be more or less defective. The assistant reported same to the Council on a written complaint, *i.e.*, one street with the several owners and occupiers named in a schedule. Can notices under Sec. 41 of the Act of 1875 be served in this case by the chief Inspector without having a written order from the Council to enter premises and examine, seeing that a nuisance is known to exist, and the occupiers have no objection?"

Answer.—(1) In cases of defective drainage it is generally advisable to serve statutory notices under Sec. 23 or under Sec. 41 of the Act of 1875, and not under Sec. 94. When notices are served under the last-named section, and the owner makes default in complying with such notice, the Local Authority are not empowered on his default to do the work (as is the case under Secs. 23 and 41), but must summon him to appear before a court of summary jurisdiction, when it is for the authority to prove, to the satisfaction of the magistrates, who will require conclusive proof, that the defective drain is a nuisance. When the drain is so defective that an entirely new drain is to be substituted, notice should be served under Sec. 23, but when the drain requires only alteration or amendment, notice may be served under Sec. 41. (2) Yes; notice may be served upon the owners under Sec. 41 in the absence of a previous authority of the Council in writing to the Inspector to enter the premises. Notice to the owners under Sec. 23 would be equally as effective as under Sec. 41.

2135.—Sewage Disposal for Three Houses: Scheme.—"A. T. B." writes:—"The owner of a pasture field shown on sketch has recently sold to A, B, and C, building plots adjacent to the lane. The nearest sewer is three-hundred yards distant, and it is also at a level of 10ft. higher than the site of the houses. The Local Authority who have recently taken over the lane have no intention of sewering it. The owners of the plots require to build, and appeal to me to put in a sewer for them or to allow them to put in cesspools. The former I cannot do and the latter I discountenance. I suggest that they should come to an agree-



ment with the owner of the pasture to enable them to lay a 6in. main drain from their plots into a septic tank and bacteria beds at the side of the brook. Will you please give your opinion on the subject?"

Answer.—The scheme suggested by our correspondent is to be recommended. Coarse and fine bacteria beds should be constructed, and a tank if necessary. The tank and beds must not, however, be placed as shown, which is within the area liable to floods. The owners, A, B, and C, may, of course, appeal to the Local Government Board to call upon the Local Authority to provide them with a sufficient sewer. These houses are within the drainage area, and the owners will have to pay the rates for the maintenance of sewers for others, and also construct and maintain their own sewers, to which they may fairly object.

2136.—Unsound Meat on Board Vessels: Inspector cannot Seize.—"W. J. H." writes:—"I am an Inspector for a Port Sanitary Authority, and on visiting vessels I sometimes find a quantity of meat stored thereon unfit for human food. As a rule

the masters of the vessels will destroy it on their attention being drawn to it. I should like to know if an Inspector can seize meat unfit for human food on board vessels although the same is not exposed for sale. I may point out that the meat is placed on board for the use of the men, and is sometimes kept on board for five or six months. Can a Port Sanitary Inspector take proceedings against the captain for issuing to his crew meat unfit for food.

Answer.—No. The Port Sanitary Authority, through their officer, are not enabled to seize unsound meat under the provisions of Secs. 116 and 117 of the Act of 1875, relating to unsound meat, when such unsound meat is not exposed or deposited for or in preparation for sale. Neither can they take proceedings against the captain for having such meat in his possession, unless it is intended for sale as human food. It is a condition preliminary to such proceedings that the meat must be for sale or intended for sale for the food of man, and these conditions are absent in the case named by the querist.

2137.—Stable is a Domestic Building under Building Bye-laws.—"Engineer and Surveyor" writes:—"My Council have the Model Bye-laws as to New Streets and Buildings in force in the district. There is no definition as to whether a stable and coach-house comes under the head of a 'building of the warehouse class,' or whether it is a 'domestic building.' Will you kindly give me your views on the subject?"

Answer.—A stable is a "domestic building," and the provisions of the bye-laws as regards the mode of construction of "domestic buildings," open space at rear, &c., may be enforced. We answered a similar query—No. 1862—in our issue of June 26th, to which we advise the querist to refer.

2138.—Nuisance from Defective Spouting.—"Subscriber" writes: "In this district, which is a rural one, I have served notices on a large number of owners with reference to the insanitary condition of their property. A portion of these notices refers to defective gutters and downspouts. In some instances such gutters have never been fixed whilst others have been allowed to get into a bad state. Complaints have been made in many cases concerning damp walls, floors, &c., due to the want of or defective gutters and downspouts, as the water flows off the roofs and down the walls and percolating under the ground floor, causes a considerable amount of dampness. I have been told by one person that I have no power to interfere in cases of this kind. Will you kindly advise (1) Can such cases be dealt with under Sec. 91 of the Public Health Act, 1875, where no gutters and downspouts have been fixed, and also where they have been fixed and allowed to get into a bad state, and can you give me any case or cases which have been decided on these points?"

Answer.—For the purposes of the Public Health Act any premises which are, as defined by Sec. 91, in such a state as to be a nuisance or injurious to health shall be deemed to be a nuisance liable to be dealt with summarily in manner provided by the Act. There is no doubt, in our opinion, that dampness in dwelling-houses caused by the absence of or defective rain-water spouting is a nuisance within the section. In confirmation of this view we may cite the judgment of Wills, J., in Reg. *v.* Parlby, 22 Q.B.D., 520; 60 L.T. (N.S.) 422; 53 J.P. 327, in which he says that the clause of Sec. 91 to which we have referred is confined to cases in which the premises themselves are decayed, dilapidated, dirty, or out of order, as for instance where houses have been inhabited by tenants whose habits and ways of life have rendered them filthy or impregnated them with disease, or where foul matter has been allowed to soak into walls or floors, or where they are so dilapidated as to be a source of danger to life or limb.

2139.—Sanitary Inspector's Duties: Superintending Abatement of Nuisances. — "Sanitary Inspector" writes:—"The Health Committee of this Urban Sanitary Authority have provided a book into which I, as Sanitary Inspector, must enter all nuisances that have been reported to the Committee, and for the abatement of which they have been given orders for a legal notice to be served upon the persons in default. After the particulars have been entered in the book it has thereupon to be inspected by the Surveyor to the Council, and if he requires any orders to carry out the works, to remedy the nuisance, or otherwise learns that such works are in progress, he has to superintend and to see to the due execution of the same, and enter into the said book a record of their progress. And, further, he has to superintend the execution of all works required to remedy nuisances arising from structural defects. Will you please advise as to whether the Committee can lawfully order me to produce my book to any official of the Local Authority except the Medical Officer of Health? Can a Sanitary Authority prevent a Sanitary Inspector from superintending the abatement of nuisances if the work is carried out by a contractor, as per Section 13 of the Local Government Board Regulations of the 23rd March, 1891?"

Answer.—By Clause 15 of the General Order of the Local Government Board of the 23rd March, 1891, as to Regulations in respect to the duties of Inspectors of Nuisances, it is provided that "in matters not specially provided for in this Order, the Inspector shall observe and execute all the lawful orders and directions of the Sanitary Authority and the Orders of the Local Government Board which may be hereafter issued, applicable to his office." We are of opinion that the order of the Urban Sanitary Authority requiring the Inspector to produce his books to the Surveyor—though an unusual one—is not an unlawful order, and that it may be enforced. (2) The Clause referred to by the querist provides "that the Inspector shall, if directed by the Sanitary Authority to do so, superintend and see to the due execution of all works which may be undertaken under their direction for the suppression or removal of nuisances within the district." Inasmuch as the Authority has not, as is optional for them, directed the Inspector to superintend the execution of such works, it is not therefore compulsory on him to do so. The procedure of the Sanitary Authority appears to us to be unusual. The Sanitary Inspector may, if he so chooses, see that the work required to be done is carried out. He might usefully seek the opinion of the Local Government Board as to the interpretation they place upon their orders in the cases named by him, by addressing a letter to the Secretary, Local Government Board, Whitehall, London, S.W.

2140.—Sale of Food and Drugs Act, 1899: Selling Milk from Cans without Inscription thereon.—"T. R." writes:—"What is the course of procedure which I ought to take in reference to the following matters:—(1) A milk seller selling milk from a vehicle which has no name or address thereon. (2) A milk seller selling milk from a vehicle with name and address conspicuously inscribed thereon leaves the vehicle at the head of the street after filling a large hand can from it, and proceeds along the back streets selling milk to customers from the hand can on which no name or address is inscribed save that of the maker of the can. (3) A milk seller delivering milk to his customers daily by means of two hand cans alone, on which no name or address is inscribed other than the makers, as in case (2). Does Sec. 9 of the Food and Drugs Act, 1899, mean that all these milk sellers are liable to a penalty?"

Answer.—Yes. Section 9 of the Act referred to applies to each case, and each of the tradesmen contravenes the provisions of the section, and is liable to the prescribed penalty.

2141.—"Proof Spirit": Meaning of Term.—"E. P.," writes:—"Will you kindly give me the definition of 'Proof Spirit,' and how same is to be obtained?"

Answer.—We answered in our issue of May 19th last, Query 1479, a similar query, to which we beg our correspondent to refer.

2142.—Books for Town Surveyors Recommended.—"A. K." writes:—"Will you kindly advise me as to the best books on preparing specifications and bills of quantities, with prices of same for the following classes of work, viz.:—Town surveyor's duties: roadmaking, sewerage works, sewage works, waterworks, &c.; builder's work: plumber, bricklayer, joiner, mason, slater, painter, &c. Also the miscellaneous matters arising in the sanitary administration of towns generally?"

Answer.—The following books are recommended as being probably the best and most up to date of their kind, viz.:—*Roadmaking*: Aitken's "Roadmaking and Maintenance," price 21s.; Boulnois' "Carriageways and Footways," price 5s. *Sewerage and Sewage Disposal Works*: Moore's "Sanitary Engineering," price 32s. net; Dibdin's "Purification of Sewage and Water," price 21s. net; Thudichum's "Bacterial Treatment of Sewage," 1s. 3d.; Adams' "Local Government Board Requirements for Bacterial Sewage Disposal Works," price 2s. 6d.; *Water Supply*: Burton's "Water Supply of Towns and the Construction of Waterworks," price 25s.; McPherson's "Waterworks Distribution," price 7s. 6d. *Builder's Work*: Macey's "Architectural Specifications," price 21s.; also "Specification for Architect, Surveyor, and Engineer," price 5s.; Hellyer's "Plumber and Sanitary Houses," price 12s.; Siebert and Biggins' "Modern Stone Cutting and Masonry," price 7s. 6d.; Rivington's "Building Construction," in 4 vols., price, vol. i., 10s. 6d.; vol. ii., 10s. 6d.; vol. iii., 21s.; and vol. iv., 15s.; Christy's "Joints Made and Used by Builders," price 3s.; Leaning's "Quantity Surveying," price 15s. Other books recommended for a Town Surveyor are Boulnois' "Municipal and Sanitary Engineer's Handbook," price 15s.; Maxwell's "Removal and Disposal of Town Refuse," price 15s.; Dibdin's "Lime, Mortar, and Cement," price 5s.; Jensen's "Modern Drainage Inspection and Sanitary Surveys," price 2s. 6d.; and Jensen's "House Drainage and Sanitary Fitments," price 5s.; Angell and Morley's "Practical Guide to Sanitary Legislation," price 12s.; Mackenzie and Handford's "Model Bye-laws under the Public Health Acts," price 25s. Any of the books may be obtained from the Sanitary Publishing Company.

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2143.—ANCIENT LIGHTS: OBSTRUCTION OF ANGLE OF LIGHT.—"Architect" writes:—"The owner of a garden C. proposes erecting a hoarding against the boundary-fence wall of a block of five houses belonging to another owner B. The tenants of these houses, whose backyards are only 8ft. 6in. in depth from houses to boundary fence, throw rubbish over the fence wall into C.'s garden, and C having determined to stop the nuisance caused by the tenants, proposes to erect a hoarding extending to a height of 4ft. above the top of the fence wall, which will be carried on iron standards independent of the fence. The top of the hoarding will be within an angle of 63 deg. from the sills of the cottage windows. Can C. erect the hoarding as proposed without being liable to B.? The boundary wall has been in existence as at present some 35 years."

Answer.—The querist evidently labours under the misapprehension that an erection placed at such a distance and height from an ancient light as to prevent the light falling on to the window at an angle of 45 deg. is sufficient ground to infer that the light is materially obstructed. The doctrine of the angle of 45 deg. has long since been exploded. Where any building has acquired an easement of light, and the light is subsequently obstructed by a new building or erection, it is immaterial whether the new structure is erected at an angle of 45 deg. or at a greater or less angle. The real point is to ascertain whether the easement has been acquired, and, if so, does the new structure obstruct the light.

2144.—SOLUTION OF FLUORESCEIN FOR TESTING DRAINS.—"W. W." writes:—"In THE SANITARY RECORD of August 14th last, page 158, an alkaline solution of fluorescein is recommended for testing drains. I should be greatly obliged if you would inform me where this may be obtained and at what price. Local chemists do not appear to stock it."

Answer.—Fluorescein solution is made by dissolving two grammes of fluorescein in 100 cc. of a 2 per cent. solution of potassium carbonate, and if not obtainable from a local chemist can be procured from Messrs. Francis Sutton and Co., chemists, Norwich. We are unable to state the price.

2145.—POOR RATE AND ASSESSMENT AND COLLECTION ACT, 1869: RATING OWNERS.—"Perplexed" writes:—"I own a house formerly rated at £8. Twelve months ago I signed an agreement brought to me by the Assistant Overseer to cover a period of three years (called compounding), thereby making me responsible for the rates whether occupied or not, in consideration of which they granted me a certain allowance upon each rate. Upon receiving my last demand note I find that they have raised my rateable value from £8 as above stated to £9 5s., debarring me from the privileges granted under the compounding arrangement, which does not apply to properties rated above £8. *Query.*—Can they violate the terms of the before-mentioned agreement in this manner and without formal notice?"

Answer.—As the rateable value of the house has been increased, the agreement has now no application. No notice from the Overseers was, it appears, necessary. In Norwood Overseers *v.* Salter (892), 2 Q.B. 118, an order of the Vestry had been made under Sec. 4 (directing the Overseers to rate the owners); and an owner had made an agreement under Sub-sec 2 of that section in respect of a house which at the date of the agreement was within the limit of rateable value prescribed by Sec. 3 of the Poor Rate Assessment and Collection Act, 1869. Subsequently a new valuation list was made, in which the rateable value of the house was raised above the prescribed limit. In the first rate, based on the new valuation list, the Overseers rated the occupier, who contended that the owner should have been rated pursuant to the order of the Vestry. The Overseers contended that the rate must necessarily follow the valuation list, and that the rateable value as it appeared therein at the date when the rate was made must determine whether the house fell within the prescribed limits of rateable value. Hawkins, J., said:—"In my opinion the true and reasonable view to take of Sec. 3 is, that it permits such agreements to be made in respect of any house or houses so long as it or they do not exceed the limited rateable value, but no others; and that agreements under Sec. 3 should be construed as having application to the hereditaments mentioned in them only so long as such hereditaments continue of a rateable value not exceeding the limited amount."

2146.—FORMS OF NOTICES BY SANITARY AUTHORITY.—"Inspector" writes:—"Will you kindly inform me whether the enclosed forms of notices and resolutions under Secs. 23 and 41 of the Public Health Act, 1875, will be in order, providing I can get my Council to pass same?"

Answer.—We advise the querist to procure the model forms under the Sections named by him, and published by Messrs. Shaw and Sons, Fetter-lane, London, E.C., with regard to notices, &c., in preference to the forms drafted by him. A catalogue of public health forms and notices will be sent by the publishers on application.

2147.—PROSECUTIONS UNDER MERCHANDISE MARKS ACTS.—"Inspector" writes:—"Can you tell me of an association that takes up prosecutions under the Merchandise Marks Act, such as, for instance, foreign butter sold as English, &c.?"

Answer.—We believe the querist will find the Trade Marks Protection Society, 1, Furnival-street, London, E.C., is such a society as that to which he refers.

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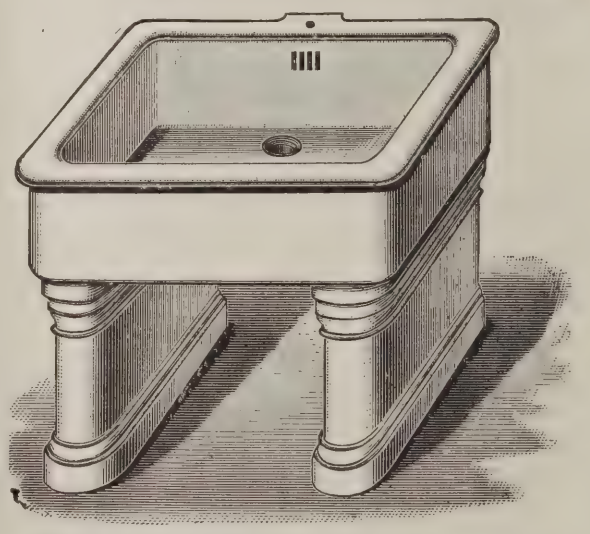

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THE HOUSING OF THE WORKING CLASSES IN SCOTLAND.

By Wm. Robinson, M.D., M.O.H., Paisley.

It is recognised that the scope of the Acts at present in vogue is not sufficiently comprehensive and clear to enable Local Authorities to move with the freedom that they ought. Legislation is promised, it is true, but that is no reason why something should not be presently done.

Paisley stands in a peculiar light as regards the need for houses for the labouring classes. When one advocates the provision of better houses for the working classes, the very practical objection is placed in the way that there are numbers of houses to be had for the asking, and that their rents are no greater than the houses it is proposed to erect. I say that seems a most unanswerable objection; but let us approach it a little more closely. When we do so it will be discovered that a great part of the objection falls to the ground. First, we find the empty houses, of which there are not a few, devoid of the very benefits that new houses under a Corporation scheme would possess. For instance, there is bad amenity, faulty ventilation of the rooms, often an inadequate water supply, or a water supply common to several houses. The rooms, if ticketed, would not in many cases allow the housing of more than one or two adults, for they are small, low in the roof, and constructed to accommodate a box bed. The box bed in itself is one of the evils that encourages, by the defective circulation of air, pulmonary diseases. And lastly, there is no such a thing as a water-closet attached to the houses under description.

The mention of the boxed-in bed leads me to say a word upon this important feature; for this method of structure will be strictly barred in the artisan's house of the future. Not long ago I caused inquiries to be made regarding the character of the houses in which many of the deaths from tubercular diseases of the lungs had taken place. I found that in nine cases out of ten the patients had lain in dark boxed-in beds which were surrounded by hangings and curtains. In fact, every condition had been there to encourage the progress of the disease from which the patients were suffering. Medical men are only too familiar with the difficulties they have to contend against when trying to diagnose the nature of disease where the sick person is lying upon one of these dark and almost inaccessible beds. That these houses gain for themselves a bad reputation is not to be wondered at, nor is it a matter for surprise that so many of them are empty. I mention these facts to answer the argument as to the existence of so many empty cheap houses in the burgh. In connection with this inquiry that was made, the question of wages was also gone into. In not a few cases people were living in families of five and six in two-roomed houses, and the gross wage coming into the house every week was over £2. Even in the one-roomed houses the wages were found to be now and again about 30s. Therefore, if these people have this money coming in and are willing to pay £8, £9, or £10 for their houses, which houses have no modern sanitary provisions attached to them, how much more willingly will they pay the same money for a house that is fitted with every necessary convenience? I will at once be attacked, I have no doubt, for this free manner of speech and thought, because I am striking at the root of private enterprise. I am threatening to encourage people to leave their houses and to rob the landlord of his rent. If that suggestion is raised I can only answer it by saying that public health and landlords' interests are not synonymous terms. The Local Authority that desires to have a healthy town must look after the health of its citizens. That is the whole sum and substance of the matter at issue. I cannot but admit it seems hard that a man should spend perhaps hundreds of pounds in acquiring property so as to let the houses with a profit, and suddenly to discover that a Corporation is seeking to undersell him. For an answer to that again, I have but to point to Glasgow, where the Corporation enterprise as regards houses for the working classes has led private enterprise to go and do likewise. Private enterprise can always cope with any enterprise if it chooses to put its best foot foremost. Legislation and Acts for the better housing of the masses would never have been called for had private enterprise been maintained at a uniform level of excellence. It is the existence and the promise of further legislation that frees the Medical Officer of Health of all blame when he advocates improved dwellings for the labouring classes. It does so because it is a culpable neglect if the Medical Officer of Health fails to do his duty by his Local Authority as regards pointing out remedies for existing evils (Housing of the Working Classes Acts, 1890, Section 5).

The Act just quoted is divided into three parts; strictly speaking it is divided into seven parts, but for the present the first three are to our purpose.

Under Part 1.—Large areas and slums can be dealt with.

Under Part 2.—Individual houses can be made fit for human habitation, or failing that, they may be demolished. Obstructive buildings can be demolished. Small areas of unhealthy houses can be pulled down and reconstructed.

Part 3 refers to the erection of dwelling or lodging-houses for the working classes in districts where the same are required.

Having had the opportunity to discuss the matter with some of those intimately interested in this subject, I find that the inclination is to approach the subject in a careful manner. That is to say, there is no desire to leap into experimental darkness. The suggestions are eminently practical, and worthy of every support.

Therefore the adoption of Part 3 seems to possess not a few advantages.

First, the provision of dwellings overcomes the objection so frequently raised against the demolition of houses before others are raised in their stead. Some towns have fallen into that error with unfortunate results to the unhoused people. If, on the other hand, the houses are built, one will be in a position to select the future inhabitants of these houses from localities that are unhealthy by repute and experience.

Now there are one or two points that might be emphasised when dealing with the subject at the present time.

The first is the site of the proposed houses. That should unquestionably be on the outskirts of the town. In the first place that relieves congestion, and in the second place it means a vast difference in the future well-being and health of these people. Locomotion will soon be made easy and cheap to all parts of the town, so that the objection against difficulty of access will be easily overcome.

Secondly, there is the particular class of people to be dealt with, and that is a somewhat difficult problem. The feeling seems to be in favour of providing houses for the very poor. Houses, in other words, that do not cost any more than £4 a year of a rental. The object is most commendable, but to carry out the experiment to a successful issue, there should also be provision made for a number of two-roomed houses at a slightly higher rental. Now, one of the strongest arguments that will be levelled against the one-roomed houses for this very poor class of persons will be that if they cannot keep their present houses in a cleanly state, how are they to behave any better in the suggested houses? I think the answer is easy, though it will also meet with objection. The presence of a caretaker in each tenement will act as a sufficient guarantee that the houses and precincts will be kept in a proper state of order and clean-

liness. The objections that I have hinted at will be that by placing a caretaker over these people you take away their spirit of independence. I fear that line of reasoning will not apply to a class of people who require to be policed, practically speaking, into good conduct. In fact, they are the people who abuse the privilege of liberty by riding over the top of it. The presence of a caretaker can do no harm; he will do good. His absence on the other hand is certain to lead to neglect and slipshod methods of house cleaning. These houses are never meant to be charitable institutions. They are intended as the Acts imply to be efforts on the parts of Local Authorities to teach people how they may lead better and more healthy lives when provided with every means that is possible to make them healthy. Rents will be carefully collected, and backsliders must abide by the result of their sins of omission and commission. If the suggestion that a hundred different families are to be provided for is carried out, I would add the further suggestion that a percentage of these householders should occupy two-roomed houses at a rental of from £6 to £8.

In both classes of houses bath-room accommodation ought to be provided. The bath-rooms, as apart from the water-closet accommodation, would be common to the families on each stairhead. Say there were four on each landing, then there would be two baths for the four families. In the better houses there would be a bath in each house. Hot water could be provided from a boiler on the basement flat, and controlled by the caretaker. Arrangements could easily be laid down for the methodical supply of hot water, but only to the baths. The mind at once associates something very elaborate in connection with a bath-room. Practical men know, however, that a bath need not be a very costly thing. Its benefit no one can possibly deny.

I would impress very strongly upon the Local Authority the next point. This is with regard to the construction and disposition of the houses and tenements. All the doors should enter off galleries. There will be in that way no doors entering from a dark passage. Each door, too, will admit to a separate house. On no account should more than twelve houses be allowed in each tenement. Three flats will be quite high enough. To emphasise this feature I can state that Edinburgh is seeking in its new Bill before Parliament to restrict the future number of houses on a stair to twelve.

As a further improvement, it might be suggested that the roof of the tenement be rendered flat like the roof of an Oriental house.

Surrounded by a high iron railing, this would be a safe place for children to play, away from the dust and mud of the streets, as well as a useful spot to dry clothes belonging to the householders.

I can only conclude my remarks upon this very important subject by quoting from a speech made by Alderman Purcell, of Liverpool, at the last Congress of the Sanitary Institute, when this important subject of the Housing of the Working Classes was discussed. He said, "But in Liverpool they did go on the rates for 1½d. or 2d. in the £. And if it was necessary the Council would grant them 6d. in the £. If municipalties spent money on libraries, museums, parks, gardens, and infectious diseases hospitals, was it not fair and right that a few thousands should be spent in preventing infectious diseases?"

At the Shifnal Rural District Council last week, Dr. Whitaker, Medical Officer of Health, presented his annual report, showing satisfactory conditions in the district. Estimates for the ensuing year on account of highway expenses were adopted as follows:— Shifnal, rural district, £2257; Shifnal, special drainage district, £362 10s.; Blymhill rural district, £316.

Local Government Board Reports.

The Sanitary Administration of Boston.

The borough of Boston, Lincolnshire, judged from the impressions gained in the course of "flying visits," and now by the reading of Dr. S. Monckton Copeman's report on its sanitary condition, provides an apt illustration of the old adage that "things are not what they seem to be." To the casual observer the borough presents a cleanly and healthy appearance, more particularly in the main thoroughfares. Even the by-streets are tolerable, except for those who have tender feet, which affliction makes a journey across the cobbles a weariness to the flesh. But behind all this apparent cleanliness there lies a laxity of administration which is fraught with the gravest danger to the inhabitants. The truth is there is an utter lack of municipal spirit, or perhaps it would be nearer the truth to say that years ago, what enterprise the governing powers possessed exhausted itself in "Boston's folly"—the docks—and since then every other need of the town has been starved.

Some years ago Dr. Bulstrode had occasion to visit Boston during the progress of the cholera survey, and reported unfavourably on the drainage, sewerage, refuse removal, and water supply. Following this report, the Local Government Board ordered an inquiry, and sent down a series of recommendations to the town, but after a lapse of seven years scarcely any effort had been made to carry these into effect, and so another inquiry was ordered, and Dr. Copeman was sent down last year.

The estimated population of Boston is about 16,000; the area of the borough is 2688 acres, and the rateable value £47,240. At the outset of Dr. Copeman's report, he seems to imply that the weak spot in the administration of the town is found in the Surveyor's department. He incidentally observes that within the past five years 235 houses have been built. "There is," he remarks, "supposed to be supervision of building operations by the Surveyor's department, but seeing that no record of inspections is kept, and that no certificates are issued, notwithstanding a bye-law requiring that new buildings shall not be occupied before such certificate has been granted, it is difficult to judge whether these duties are carried out in other than a perfunctory manner."

Dealing with the various sanitary works, the water supply is first noticed. This is secured from a gathering ground at Miningsley, some twelve miles from the town, and about 120ft above it. The reservoir is capable of holding, when full, about 75 million gallons. The waterworks, which are owned by a private company formed in 1849, include five filter beds—four old ones, and a fifth larger one, recently added. Each of the four smaller beds measures 49ft. by 63ft., and 6ft. in depth; the fifth bed measures 102ft. by 52ft., and is 7ft. deep The filtering material in the older beds consists of layers of gravel of varying degrees of coarseness for a total thickness of 2½ft., above which there is a layer of sand of an average depth of 2½ft. The larger bed has similar layers of sand above and gravel beneath, but the total thickness is somewhat less than in the other filter beds. Beneath the gravel, however, are two rows of cellular brickwork, 6in. in depth. The sand used is obtained from the river Trent, and is washed before being laid down in the beds. The Inspector was informed that the surface of the sand in each filter is scraped about once a week, and that the whole filtering material is changed yearly. Dr. Copeman reviews the steps taken to test the quality of the water. On the whole these were satisfactory, but the mains are laid too near the surface, and in the summer the water is delivered to the houses at 67 deg. Fah. The manager of the works is well spoken of, and there are signs of

further improvement being made, so that a better quality of water is gradually being secured.

The sewerage system is divided into two parts—east and west. There are some peculiarities in connection with the working of this branch of the administration which may be of interest to our readers. East of the river, the sewage of the more central and oldest part of the town discharges to an ancient sewer called the Barditch. This was originally uncovered from end to end, but it has gradually become covered in by the owners of the property through which it passed, so as to enable buildings to be erected over it. This having been done on no definite system the dimensions of this sewer vary considerably at different parts of its course, while for the most part the bottom is very uneven, and the sewer has no regular fall. At intervals along its course are large catch pits, the periodical emptying of which is not only a matter of considerable expense, but often of much annoyance to persons living in the neighbourhood. This sewer is under the control of a body termed the Court of Commissioners of Sewers; the Sanitary Authority of the borough, curiously enough, having as such, no voice in its management, although members of the Town Council are *ex officio* members of this Court. On an official of this Court, known as the Dykereeve, devolves the responsibility for the condition of the dykes and sewers under their charge. Surely this is one of the relics of antiquity that might easily be dispensed with. The working of the Barditch sewer is described in detail. One fact is particularly noted, viz., that it is unventilated, and, as a consequence, when the manholes are unsealed, or the sewer head opened, very foul smells are complained of.

There is still another drain on the east side, which is called the Maud Foster (Bargate) Drain. This appears to be quite inadequate for the demands made upon it; but the unique control has prevented any improvements being carried out, notwithstanding that they have been advocated for over forty years. A dog-in-the-manger policy has been pursued. First, the Urban Authority would propose something. This did not satisfy the Rural Sanitary Authority, which would suggest another scheme. Neither would give way, and so the nuisance has dragged on.

What the West Boston sewerage is like may be gathered from the following extracts:—It commences in Carlton-road, passes through Fydell and Irby streets on to King-street. From this main line branches have been made from time to time; manholes are placed at given intervals. Beneath each manhole the floor of the "sewer is deepened to form a catch-pit for solid matter, which, as I was informed, is cleared out 'from time to time.' No ventilating shafts have been erected along the course of the sewer, as the Surveyor has advised the Sanitary Committee that they enable the effluvia to escape 'more on a level with the bedroom windows of houses,' adding, in a report to the Committee, that he had found it impossible to obtain suitable sites for their erection. Recently manhole covers have been made air-tight, and sewer air, especially when under pressure, through the outfall being blocked, is likely to escape into the houses. So likely is this to happen that the Sanitary Committee now suggest that it would be better to 're-open the manholes, and endure the occasional smell arising from them, than run the risk of sewer gas escaping into houses through improperly-trapped drains.'"

After describing the flushing arrangements, Dr. Copeman says that "the tank at the head of the sewer which passes down Sleaford-road was, at the date of my visit opened, and the cover of the manhole nearest below it was also removed. As a result, a most objectionable smell asserted itself, making my inspection of the interior somewhat difficult. The catch-pit at the bottom of this manhole was full of semi-solid matter, which extended into and half filled the sewer itself. On the discharge of the contents of the flushing tank, no appreciable disturbance of this semi-solid deposit had occurred after an interval of ten minutes, when observation was discontinued. The flushing tank in Sydney-street was said to be out of order. In Carlton-street an experiment in flushing on a gigantic scale, independently of the flushing tanks, had just been carried out under the supervision of the Surveyor. Water from large clay pits had been pumped by steam power for a fortnight into the sewer at a manhole where, by blocking up one or other of the sewer openings, the water could be made to pass along either to the right or left, the sewer being practically level at this point. As the result of the influx of so large a quantity of water (at a cost, as the Surveyor informed me, of about £20) this sewer was free from deposit between the manhole and the junction of the sewer with the one in Sleaford-road."

Some manhole covers were removed for inspection. "In the former sewer, I found the accumulation of stagnant sewage so considerable that it was impossible to see either the inlet or outlet of the sewer. The surface of the sewage was covered with bubbles, and the smell was most offensive. In Irby-street also I found the manhole full of stagnant sewage to within about a foot of the road surface, although at the time the tide in the Haven was quite low. In short, the greater portion of the sewerage system on the west side of the town has come to constitute what is practically a gigantic cesspool, the contents of which, under existing circumstances, are never completely removed, and consequently undergo putrefactive changes *in situ*, the gases resulting from these processes finding an exit as best they can, either through or around the manhole covers or to the interior of houses. Evidence that the sewers leak in places is afforded from time to time when the roadway is opened up for any purpose near the main sewer or one of its branches. This was particularly evident early in the present year, when the ground in Granville-street was opened for the purpose of laying water pipes. In this particular street the sewer, as I am informed, always stands full, or nearly so. On this account house drains discharging to this sewer have been so laid as to enter the sewer at the top instead of at the side, as would be the case under ordinary circumstances."

With regard to excrement and refuse disposal, water-closets with flushing apparatus proper, are comparatively few in number in Boston. There exist, however, some 150 closets unprovided with any proper water supply for flushing purposes, the reason given being that the charges of the water company for the installation of a cistern and its accessories, and for the use of water for closet flushing are prohibitive. These "hand-flushed" closets are commonly very foul.

With the above exceptions, "ash-bin" closets are almost universal in Boston. The type of those closets approved by the Town Council consists of a combination of privy and ash-bin. In the ash-closets on certain premises the vaults were full up to, or even above, the level of the seat; in other instances, the vaults contained a considerable quantity of fluid. It is thus apparent that arrangements for the removal of the privy contents are inadequate. Collection and disposal of refuse from these closets is a task of considerable magnitude. The quantity of material collected amounts, according to the Surveyor's estimate, to about fourteen one-horse loads daily, or an average of from 4200 to 4300 per annum. Formerly, the material collected was in considerable demand with farmers and market gardeners in the neighbourhood, and the refuse was readily disposed of at a price of from 2s. to 2s. 6d. per load, delivered free.

At present, the material, consisting of fæcal material mingled with a certain proportion of ashes, together with potato peelings and other household refuse, such as old tins, boots, paper, &c., is carted outside the

town, for distances varying from one to two miles, and tipped into disused brick pits. Concerning these dumping grounds, the Medical Officer of Health says in his annual report for 1899:—"An intolerable nuisance is created in almost every outskirt of the town by the accumulation of huge heaps of refuse and garbage, deposited by the Sanitary Authority and allowed . . . . to remain for months, pouring out the most sickening smells. During the summer and autumn, many houses are almost uninhabitable, being invaded by myriads of flies, which are bred upon these putrid heaps of filth."

To secure abatement of the nuisance from the present method of disposal of the town's refuse, the Medical Officer of Health recently suggested to the Sanitary Committee the advisability of erecting a destructor. The Committee have expressed the opinion that difficulty would arise from a destructor having to be placed some distance away from the town, and that in whatever spot it were placed, a very great nuisance would be created by the succession of carts delivering refuse to it, and they say that they have not succeeded in finding any place where they think a destructor could be used without being objected to by the surrounding inhabitants. The Inspector ascertained that the Surveyor was aware of no less than six possible sites, of which one appeared to possess certain special advantages, in that it is situated in the lowest part of the west side of the town, and so would make a convenient site for a pumping station for lifting the sewage from the district where the drainage at the present time is most defective. Power for pumping sewage, or for generating electricity, could be rendered available by the consumption of the refuse.

After referring to other sanitary conditions, Dr. Copeman has some strong remarks on the manner in which the bye-laws have been administered. He says:—"The question of bye-laws having been referred to by the Medical Officer of Health, in his annual report for 1899, the Sanitary Committee in their published criticism of that report, say:—'Your Committee have considered sometime since the advisability of fresh bye-laws. The present ones are old, but the Surveyor advises the Committee that they are sufficient.' . . . In another section of this same report, the Committee say, in reference to the question of certain sanitary defects in houses to which the Medical Officer of Health had called attention:—'No certificate of completion had been given by the Surveyor,' intimating that the Medical Officer had been unduly hasty in reporting on the matter, since a bye-law exists to the effect that no new dwelling shall be occupied until the Surveyor shall have given a certificate that all the sanitary and other arrangements have been carried out in accordance with regulation. Being desirous to obtain evidence as to the manner in which the present bye-laws, considered by the Committee, on the authority of the Surveyor, to be sufficient for all purposes, are enforced, I took as a test case the question of building certificates, and applied to the Surveyor to show me the counterfoils of such certificates as had been issued during the past five years. During this period about 235 new houses, as he informed me, have been erected in Boston, but except in a single instance no 'certificate of completion' had, I found, been issued by him during the same period. The exception occurred in the month of May, 1900, when a certificate was issued in reference to a house now in the occupation of the son of the Medical Officer of Health. Only seven certificates had been issued during the last thirty years, yet a considerable penalty (£5 and £2 per diem during default) is supposed to be inflicted on persons occupying a house in respect of which such a certificate has not been issued. In this connection, also, it is of interest to learn that the Committee in their own words 'have never yet had before them a case in which the present bye-laws have not been sufficient to enforce any liability they have thought necessary.' The Town Clerk was only able to tell me of a single instance in which a penalty had been inflicted for contravention of the building bye-laws.'

The isolation hospital is an illustration of "how not to do it." In 1881 an old farm house, situated about one and a-quarter miles from Boston, and about a quarter of a mile from the docks and landing stage, was acquired as an isolation hospital, for the joint use of the Urban, Rural and Port Sanitary Authorities. It contains four rooms intended for use as wards, a bedroom for the caretaker and his wife, and a large and airy kitchen, which is also used as a living-room. The hospital, although well isolated from other buildings, is too near the public roads. On the same site there is in addition a small brick building erected in 1893, which is known as the small-pox hospital. This building is damp. It has no furniture, and there is no closet accommodation. Attached to the farmhouse building are a couple of ash closets, which I found in a filthy condition. There is a building which does duty for a laundry, and several out-houses, one of which contains an old and clumsy ambulance; but this is shortly to be replaced by a more modern and convenient conveyance. There is no mortuary. Rain water is stored in an underground tank and pumped up for use in the hospital. The caretaker informed me that it is usually very dirty, and has an exceedingly unpleasant taste. For drinking, it is now always filtered through a Berkefeld filter. Slop water passes to a cesspool, which is emptied occasionally. A labourer and his wife live on the premises as caretakers, for which they are paid £30 per annum. When there are patients in the hospital the man is paid an extra 15s. per week, and the woman is paid 3s. a week for each patient up to a limit of 12s. for acting as nurse. She has not had any hospital training. Hitherto, the various Authorities concerned have not provided a trained nurse, although private practitioners who are allowed to attend their own patients in the hospital, have on occasion, installed an efficient nurse in charge of such cases. This arrangement has been productive of friction, owing to the respective duties of the nurse and the caretaker's wife in such instances not having been accurately defined.

In conclusion, Dr. S. Monckton Copeman, makes the following recommendations:—

(1) The Town Council should at once carry out a comprehensive scheme for the efficient sewering of the town.

(2) The Town Council, pending the general adoption of water-closets, should adopt an improved system for the disposal of excrement and other refuse.

(3) More extensive provision than at present exists should be made for the isolation of cases of infectious disease, in view of the fact that the farmhouse, which now serves as the isolation hospital, in addition to having to meet the demands made upon it by the urban sanitary district, has further to provide for the wants of a population of about 25,000 in the rural sanitary district, and an unknown number from the shipping of the port. The present administrative arrangements should be improved, and mortuary accommodation should be provided at the hospital.

(4) The Town Council should, as speedily as possible, provide an efficient apparatus for the disinfection of infected articles and clothing.

(5) The Town Council should, under the advice, and with the assistance of their Medical Officer of Health, revise and extend the existing bye-laws, and bring them, so far as the special circumstances of the district permit, into accordance with the model series issued by the Local Government Board.

(6) The Town Council should draw up and submit to the Local Government Board regulations under the Dairies, Cowsheds, and Milkshops Order of 1885-1886, in accordance with the powers conferred upon them by Section 13 of that Order.

THE PROBLEM OF INDIAN TOWNS.

Any man who has been through an Indian town or an Indian village, says a writer in the *Madras Times*, even if an habitually unobservant man, cannot but have noticed under what frightfully insanitary conditions the greater part of the inhabitants, even those of the well-to-do classes, and much more so the poor and labouring classes, exist. His eyes and his nose must have had their attention forcibly and disagreeably called to this distressing fact nearly a hundred times in every hundred yards of his journey. Madras is in this respect particularly bad. The streets and the roadside drains in the early mornings provide truly abominable tableaux. Particularly bad is the state of affairs in the larger townships of this far-stretching city. We will attempt no description. A hint must be more than enough, for the facts shout aloud for attention, along even the chiefest of our great roads in the best quarters of Madras. Everyone knows, everyone is unfortunately forced to observe. Only the police, whose duty it is to take cognisance of these offences against the health and proprieties of the settlement, have the enviable power of being able to shut their senses to the facts. Things are abominable in Black Town, New Town, Vepery, Triplicane, Mylapore, and all the thickly-populated portions of the city, but they are only a little better in Egmore, Teynampet, Chetput, and the other open European quarters, where each house is built in a park. All through these beautiful quarters are scattered parcherries and townlets of varying sizes, hiving on the edges of the main roads, and each one is a plague spot, where the very ground has long rotted beyond rottenness with uncleanly things. In the midst, and on top of all this hideous filth, the people swarm and work, eat and sleep, are born and die. Fortunate indeed is it for Madras that it is a "City of Distance!" Lucky the European inhabitants who grumble at the fact that it is a day's work in driving to make a round of half-a-dozen calls! Were it not for this the new cemetery at Chetput would soon be the most thickly-peopled part of the town, and the Municipality be forced to take up another park for the army of those who have gone to the majority. So far from grumbling at the prevalence of fevers and the height of the death-rate, we should rather wonder how Madras remains as healthy as it does. Considering the inexpressibly filthy habits of the majority of the lower class dwellers in Madras, their sublime contempt for sanitation and the regulations, the difficulty of draining the place, and the festering sites on which the townships stand, it is simply astonishing how wonderfully, and undeservedly, healthy the city is. When the average man sees the pigstyes that go to make up the greater part of this place he almost wishes for the advent of a second Lally, followed by an army of plundering camp followers, so that the horrors might be burned out and the place cleansed by fire. It is to him a source of constant wonder how human beings can continue to exist, much more grow fat and lusty, as the people of Madras and other Indian cities do, when their lives are a constant violation of nearly every condition of sanitation and hygiene. He is forced to attribute it to the great sweetener sun, and the constant open air life of most of the people, and to think the people fortunate, in that the pestilences that sweep the land regularly have not long since slain every living thing in India. The people will not improve the conditions under which they live. The greater majority have no desire for anything better, even if it be provided for them. They have no idea of decent cleanly living, let alone the advantages to themselves and their neighbours to be derived therefrom. If they are disturbed, and some of the filth in which they wallow scraped away, they object, and talk of the violation of privacy and the injury done to their religious susceptibilities. Since the plague, essentially a disease of filth, first appeared, thousands of lives, and millions of money, have been sacrificed, and will continue to be sacrificed, till the sanitary conditions of Indian cities are greatly improved. This is a thankless task and hard. The people will not dream of improving matters themselves. It is not so much that the majority are too poor to improve the conditions under which they live as that they are too utterly indifferent. They know, and desire, no better. The landlords are as bad or worse. Things must, however, be improved. The industrial conditions of India are changing, quite apart from the enormous, and steadily continuing increase in the population the establishment of the British peace has brought about. Although still mainly an agricultural country, India is rapidly being studded with great manufacturing and industrial centres. Little open towns are becoming great cities crowded with workers, and the housing and health of these workers is becoming a subject of the primest importance to the nation. The present conditions under which the lower classes in our great cities live are dangerous and undesirable to a degree, they must be improved, and that at no distant date. The workers hate improvement, and we must make them learn to at least tolerate, if not to welcome it. There is the problem, a difficult one it is true, but one which must be solved.

IN FAVOUR OF ABATTOIRS.

The Medical Officer of Health for Wigan, Dr. William Bury, has issued a report to his Corporation showing the necessity of providing a public slaughter-house. He mainly bases his recommendation on the following arguments summarised by Dr. Harris, Medical Officer of Health for Islington:—

I.—Hygienic Reasons.

(*a*) The erection of such buildings would remove nuisances from the neighbourhood of dwelling-houses.
(*b*) Putrifiable matter would be excluded from the sewers.
(*c*) Meat would be protected from liability to exposure from foul emanations.
(*d*) Thorough examination of all meat for disease would be ensured.
(*e*) The traffic in diseased meat would be materially limited.

II.—Economic Reasons.

(*a*) Less liability of the meat to spoil because slaughtered under better conditions.
(*b*) More blood and offal would be saved.
(*c*) There would be a saving from order, the proper division of labour, avoidance of driving animals through the streets, and the doing of business on a large scale.
(*d*) Abattoirs properly managed yield a fair profit.

III.—Humanitarian Reasons.

(*a*) Much of the cruelty to animals that now occurs would be put an end to, owing to the use of improved appliances for slaughtering.
(*b*) The driving of weary and exhausted cattle through our streets would be avoided owing to the abattoirs being situated near railway stations.
(*c*) The street danger to the public would be greatly lessened.

Provisonal Orders have been granted by the Board of Trade for the supply of electricity to the Local Borough Council and the Marylebone Electric Supply Company, in order that both may be incorporated in a confirming Bill and considered by the House of Commons.

THE NEED OF WOMEN SANITARY INSPECTORS.

A MEETING, which Mrs. Mylne (Paddington Guardians) was instrumental in organising, was recently held at Paddington Town Hall to hear an address on the question of "Women as Sanitary Inspectors," by Miss Alice Busk, Guardian of the Poor, and member of the late Vestry of St. George the Martyr, Southwark, an Authority which had three women Inspectors upon its staff. Alderman Colonel Blair (Paddington) presided over a good attendance.

In a few preliminary remarks, the CHAIRMAN said Miss Busk had come to Paddington to convert them as to the necessity of appointing lady Sanitary Inspectors. Personally he had not yet been "converted." There were many districts where lady Inspectors were positively necessary. In Paddington they were mostly retired people and well-to-do, and the proportion of poor was very small, so that the need did not so much exist there. If Miss Busk wanted to convert Paddington it was the right time to do so, as the Borough Council were considering the constitution of their staff, and the Committee would no doubt take into consideration the appointment of a lady Inspector. The Mayor (Sir John Aird, M.P.), and Sir George Harris (chairman of the Public Health Committee), favoured the proposal, and their able young Medical Officer of Health, Mr. Dudfield, had got all the desirable luxuries he could for them. It was for Miss Busk to prove whether lady Inspectors were a luxury or a desirable luxury. They in Paddington had always wanted women workers. There was a difficulty some years ago in getting ladies on to the Board of Guardians, but at the last election five ladies were elected, which, he thought, was very satisfactory.

Miss BUSK gave a lucid and interesting address, showing in many ways the necessity of women Inspectors, such as visiting workhouses, factories, warehouses, &c., where women and girls are employed; in visiting tenement property, and giving instructions to women as to the proper feeding of children, cleanliness, ventilation, &c.

Mr. TREHAWKE DAVIES (chairman of the Public Health Committee of the Marylebone Borough Council), in the course of a few remarks, referred to Miss Busk having quoted Marylebone as having one lady Inspector, and that she was paid the lowest salary of any Sanitary Inspector. Personally, he did not think they paid her half enough. She was a most invaluable acquisition to Marylebone, and gave every satisfaction. He only regretted that each Council in London had not half a dozen Sanitary Inspectors.

Dr. PRINCE, as a member of the Paddington Public Health Committee, also addressed the meeting at some length, and referred to the fact that no less a sum than £125,000,000 had been spent in town and country in order to improve sanitary science, and to put them on a better footing as regards hygiene. But, up to the present, they were very imperfectly informed on sanitary matters in general. Landlords had difficulties. Landlords were sometimes a class to be pitied. (Hear, hear.) They might get undesirable tenants who would spoil the best of houses. As regards a female Inspector, he thought it would be a very wholesome introduction to any Borough Council. Women were possessed of more patience and more persuasive power, and they would be very useful in educating people up to sanitary reform. People did not like reforms arbitrarily thrust upon them. Women would be able to show women what ventilation and cleanliness would do in improving comfort and health. He should be sorry to see the male Sanitary Inspector superseded. The introduction of women was not likely to lessen their popularity, but to supplement their good work.

Ald. REDMOND bore testimony to the good work being done by the women Sanitary Inspectors in Southwark, and in the course of an eloquent address said that so long as they had poor people they would have ignorance, and so long as they had ignorance they would have a low standard of sanitary knowledge, and with that a higher death-rate. He thought there was just as much need in Paddington for lady Inspectors with its many business houses where women and girls were employed. If the work of women Inspectors was to be a success, it was desirable to have women as members of the Borough Councils, to superintend and help them.

Mrs. MYLNE refuted Col. Blair's inference that there were very few poor people in Paddington. Although it was a rich parish there were some poor districts in it as would bear comparison with any in London, as the Board of Guardians knew too well. She thought a lot could be done in the way described by Miss Busk in teaching poor women who were absolutely ignorant of the laws of health. She had received letters of regret at inability to attend from Mr. E. Boulnois (Mayor of Marylebone), Dr. J. Fletcher Little, L.C.C., Lady Battersea, and Mr. Rodwell Johnson, all expressing sympathy in favour of the proposals. She (Mrs. Mylne) in supporting Miss Busk's arguments, thought that a woman could get access to houses where poor people lived when a man could not. And it needed a woman's sympathetic nature to bring about the improvements they hoped for. It had always been her feeling that what they wanted was the co-operation of men and women. It should not be one sex. They worked harmoniously on the Board of Guardians, and she would like to see the principle carried out in all departments of municipal life.

Dr. DUDFIELD (Paddington Medical Officer) said he had had no experience of women Inspectors, but he knew they had been extensively tried, and he could not recall an instance where they had been pronounced a failure. He thought that one objection might be that women object to being criticised by women. He pointed out that one-sixth of the children born died under one year of age. He attributed this "slaughter of innocents" to the ignorance of mothers in feeding. He thought women inspectors might do something in regard to cookery, and making suggestions to poor people. This he thought would do a lot to stop drinking. A great deal of drunkenness among the lower classes was due to the lack of good food at home. As regards the poor in Paddington he had noticed in some districts a change for the worse. He supported the appointment of women Inspectors, thinking there was a need of great activity in regard to public health.

The Rev. J. DIXON added his testimony as to the ignorance that existed among poor people, and the need of a woman to influence a woman. He moved a vote of thanks to the chairman, Miss Busk, and the speakers.

Miss BUSK replied, and having answered questions, the meeting was brought to a close.

TENDERS.

RUGELEY SEWERAGE AND SEWAGE DISPOSAL.

CONTRACT No. 2.

LIST OF TENDERS.	£	s.	d.
C. E. Carden (accepted), Penkridge, Stafford...	5679	18	9
G. Trentham, Heathfield-road, Handsworth...	5750	0	0
C. J. Nevitt, Stafford	5781	9	2
John Holme, "Spa" Villa, Axlestone Park, Leicester	6528	4	5

Messrs. Pritchard, Green, and Co., Engineers, Waterloo-street, Birmingham.

ANNUAL REPORTS.

Blaby R.D. — Dr. Coles' annual report on the health and sanitary condition of this district states that the population estimated to the middle of 1900 was 16,660. The birth-rate was 25·8 per 1000, death-rate 13·8, zymotic death-rate ·90, and infant mortality rate 109·0 per 1000 births. In the three previous years the rates were:—1899: 26·9, 12·6, ·97, 115·1; 1898: 28·8, 14·2, 1·1, 114·8; 1897: 31·0, 16·7, 1·9, 136·8. There was a continuous fall in the birth-rate since 1897, and it was now considerably below the average for the last ten years. The death-rate, whilst higher than that of the previous year, was well below the average for ten years. The zymotic death-rate was again low, in spite of much measles and whooping-cough in the district. There were 15 deaths from infectious diseases, and 62 from diseases of the lungs. Certificates notifying infectious diseases numbered 122. Of 66 cases of scarlet fever notified there was but one death. The only village in which this disease was epidemic was Kirby Muxloe, but there was no death there. Of diphtheria and membranous croup 18 cases were notified, one proving fatal—a very low mortality indeed. Seeing the extent of diphtheria at Leicester, it was a matter for congratulation that so little disease had occurred in the rural district. Water supply: In neither Countesthorpe nor Whetstone was a good water found, and the officer regarded Countesthorpe as being supplied with water in the worst possible manner. The Corporation of Leicester had recently extended their supply to the Cottage Homes, and he recommended that a further application be made to the Corporation for a supply to the village. Drainage: There could be no doubt as to the necessity of a sewage scheme for Blaby. The scheme proposed by Mr. Simpson had been found too expensive to suit the Blaby Parish Council, and the Sanitary Inspector had been asked to prepare plans for an alternative scheme. At Cosby, which was in a filthy condition, the scheme proposed was that known as the Cosham tanks. At Kirby Muxloe the scheme was completed, and nearly all the connections were made. At Oadby the scheme was entirely completed. For Narborough plans had been prepared. At Enderby work was in progress, and it was expected to be completed during the year. Isolation hospital: The management had been reorganised, and, in the Doctor's opinion, vastly improved.

The Sanitary Inspector's report shows that 74 building plans had been examined, and 72 approved. The sewage works at Oadby and Kirby Muxloe were working satisfactorily and discharging a good effluent. Scavenging, on the whole, had been performed in a satisfactory manner.

Kidderminster—Dr. David Corbet, the Medical Officer, and Mr. J. T. Cowderoy, the Sanitary Officer for the borough, have presented their annual reports to the Town Council. The reports indicate much activity to promote the health of the inhabitants. Mr. Corbet reports 600 births during the year; 299 males and 301 females, with 542 deaths: 294 males and 248 females; deaths in the Workhouse: residents, 63; non-residents, 24; deaths in the Infirmary: residents, 27; non-residents, 19. The ages at which the deaths occurred were: under 1 year, 103; between 1 and 5, 50; 5 and 15, 20; 15 and 25, 23; 25 and 65, 181; 65 and upwards, 165; death-rate, 21·68. The number of deaths from zymotic diseases was 46; diphtheria, 17; measles, 16; diarrhœa, 7; whooping-cough, 3; scarlet fever, 2; typhoid fever, 1. Measles was not now notifiable, but upward of 300 cases came to the knowledge of the officials, and several schools were temporarily closed. Forty cases of scarlet fever, mostly of a mild character, had been dealt with. Twenty cases of typhoid fever were reported. The number of cases of diphtheria was 75, against 43 last year. The sanitary arrangements in most cases were in good order. Many of the houses in which cases occurred were quite new, some of them having been built on made ground. No death had occurred at the Borough Hospital during the year. With regard to slaughter-houses, Mr. Corbet believed that it would be to the advantage of the public and butchers if public slaughter-houses were erected. The cleansing and flushing of the sewers had received constant attention. Two hundred and thirty houses were reported as dirty. Mr. Corbet hopes that the work in connection with the additional water supply will be pressed forward, pointing out that an intermittent supply is attended with danger. The death-rate was highest in January, when it reached 41·60, and the lowest in October, when it stood at 14·04, and it is somewhat singular to state that the birth-rate was also the lowest in October.

Mr. Cowderoy, the Inspector of Nuisances, in his report, states that the number of bakehouses under inspection was 55; number of persons registered for the sale of milk, 51; as cowkeepers, 10; common lodging-houses 5, capable of accommodating 151 persons. The seats for Shop Assistants Act is well complied with. In most of the large places of business fixed seats are provided behind the counter, in others chairs are kept; workshops under inspection, 227; canal boats inspected, 259. The "Eclipse" smoke testing apparatus for testing house drains had worked well. The butchers' shops, also the provision, fish, and fruit shops and markets, had received continuous attention. The following summary of work done in the sanitary department indicates considerable vigilance:—Samples of food procured for analysis, 64; nuisances found, 1464; drains and water-closets opened by court sweeper, 939; notices served to abate nuisances, 903; school notes served, 567; circulars served, *re* consumption, 31; infectious disease, cases visited, 386; cases removed to hospital, 22; houses disinfected, 126; gallons of disinfectant given away, 125; loads of house refuse removed, 60; ashpits cleared, 3393; privies and middens cleared, 529; portable receptacles cleared, 61,360; loads of embers procured from refuse, 56; loads of manure sold, 38; cash collected, £248 13s. 11d. Mr. Cowderoy has also taken daily meteorological observations at the station on Prospect-hill. The highest temperature occurred on July 19th, when the thermometer stood at 89·6 in the shade, and the lowest temperature was on February 10th, 13·8, the mean annual temperature being 48·5. March is popularly supposed to be the most windy month in the year. The statistics, however, do not bear out the idea. The wind velocity was less last March than almost any other month, 3003 miles being recorded, while in December the register indicated 5086 miles. February was the coldest month last year.

Shildon.—The annual report of Dr. Fielden, the Medical Officer for Shildon Urban District Council, has just been issued. It shows that the birth-rate for the year was 28·8 per thousand of the population, as against 31·9 the previous year. The death-rate was 15·3 per thousand, as against 16·5 the previous year. The deaths under one year of age were equal to a rate of 4·48 per thousand. The zymotic death-rate was 1·47 per thousand, as against 2·16 in 1899. The report goes on to say that the general and zymotic death-rates were very satisfactory, the former being 3·3 less than the county rate, and three less than that of England and Wales. The infantile mortality was 12 below the county, and one above the whole of England and Wales. Speaking of scarlet fever and isolation, the Doctor says there is, doubtless, a very great and deeply-rooted objection on the part of the public to

allow their friends to be removed to the hospital, but as time goes on this will be less marked, and they will avail themselves of the benefits of the institution. In the meantime, however, when a case occurs in a house where there is no reasonable accommodation for isolating the patient, he thought the Council should issue some definite instructions to the Surveyor to resort to the necessary legal measures to enforce removal. Sixteen cases of scarlet fever were removed to the hospital. Eighteen cases of enteric fever were notified during the year, and in ten cases the patients were removed to the hospital. There was no reason to suspect the water or the milk supply in any case as responsible for the outbreak.

Smethwick.—A summary of the work in the health department during the past year has been prepared by the Inspector (Mr. J. Fyles). One of the chief features which presents itself is the sanitary improvements which have been effected in every department, not only in premises, but also in thoroughfares and streets. A total of 1664 notices have been served; 1173 bearing on sanitary matters, while 4000 inspections and re-inspections were made. These have resulted, among other things, in the abolition of various nuisances, and securing permanent sanitary improvements. A summary of the number of conversions into water-closets is given, and this, more than anything else, shows the success which has attended the Council's endeavours to do away with the old privies and middens. The Inspector says that during the year some very objectionable nuisances have been considerably reduced and obliterated by the alteration at several of the large works, while others had decided to put in new systems and abolish the old. It is gratifying to note that similar work has been effected in several schools, and there are now only three which have not made the alteration. He gives a list of twenty-five streets which are nearly exempt from privies and middens, and refers to the nuisance caused by the cumbersome and clumsy method of depositing the nightsoil in the street. The water-carriage system is not only incomparably more sanitary than the foul midden, with all its attendant evils, but is less expensive, and only requires an ample supply of water to ensure success. The Inspector, in a concise table, shows the number of privies and middens up to last July, at which time there were 10,885 houses in the borough. There has been particular attention paid to infectious diseases, and in each case preventive measures have been adopted. There are fifteen slaughter-houses in the borough, eleven being registered and four licensed. The cowsheds number nine, and the milkshops 123. The bakehouses number thirty-eight, and all these have been periodically inspected. The total cost of collection and disposal for the year of the whole of the nightsoil and dry refuse was £3906 4s. 10d. In further details Mr. Fyles says that on the average a privy costs about 8s. per annum in collection and disposal of contents, while in the transformed system, with a portable bin and frequent systematic removal, 3s. 3d. is the annual cost. It is obvious, therefore, that the dry system is not only the most economical, but what is of higher importance, the most sanitary. The boating away at 1s. 10d. a ton is responsible for a considerable item. A vast proportion of the dry and unoffensive contents of the middens, which was originally boated away, was, by the initiation of the chairman, disposed of to a tip in order to effect a saving of expense. From a sanitary point of view also this answered admirably. When the whole of the night soil and dry refuse were disposed of by boat, the cost of this alone averaged £105 per month, against £59 at the present time—a saving of £46 per month for the last fourteen months. There had been four samples of water submitted during the year—three from wells and one from a tap. The latter was certified to be pure, and only one of the others could be condemned, with the result that tap water was at once provided. Wells having been found to be contaminated had been gradually reduced, until at the present time they number eighty, supplying about 207 houses, an increase for the year of 738 houses with tap water. The Canal Boats Act had been enforced, and 129 boats had been inspected, in which the Act and regulations were complied with in 94·6 per cent.

Thrapston.—In his annual report on the health of the Thrapston district, the Medical Officer (Dr. C. W. Elliott) states that the birth-rate has increased from 21·1 in 1890 to 24·4 in 1900, this in spite of the fact that the birth-rate all over England had diminished. The death-rate, which had fluctuated a good deal in the ten years, ended by being almost exactly the same in 1900 as it was in 1890. Great improvements had been effected in sanitary work, the drainage of most of the villages having been much improved, and the houses most carefully inspected. The total number of deaths for the entire district during the year 1900 was 170, giving a death-rate of 14·8; of these 72 were among persons over 65 years of age. The total number of births in the whole district during the year was 280. With regard to the Northamptonshire portion of the district the officer reported:—The population of this part of the district is given at 10,546. The number of deaths during the year 1900, including 11 deaths in the workhouse, was 160, giving a death-rate of 15·17. The sewage disposal works at Thrapston are approaching completion. This scheme, which is expensive, will stop pollution of the river, but does very little for the sanitary requirements of the town. Among the first should be a good water supply. The question of providing the upper part of Woodford with water is one which has been under your consideration for years, and schemes have been submitted to you during the past year. It did not appear to him to be a matter which presented any very great engineering difficulty, though he felt sure that water would have to be brought from a lower level, and would require pumping. There was really plenty of water in the neighbourhood. He would urge this matter upon them as the most pressing in the district. It is not merely that there is a scarcity of good drinking water in Newtown, but in dry seasons there is hardly any water for domestic purposes, and in the event of a fire there would be absolutely no available supply.

Thornton—Dr. F. S. Rhodes, Medical Officer of Health for the urban district of Thornton, has issued his first annual report for the year 1900, from April to December 31st. When the last census was taken in 1891 the population of Thornton was 996, but the estimated population was now 3250—the increase being due to the erection of ammonia-soda works in the district, and the increasing popularity of Cleveleys as a holiday resort. The number of inhabited houses is 650, and the estimated population in the various parts of the district, which altogether comprises 3539 acres, is as follows:—Little Thornton, 270; Mid-Thornton, 1505; Burn Naze 930; and Cleveleys, 545. During the period covered by the report there were 69 births registered (37 boys and 32 girls), equal to a birth-rate of 29·92 per 1000. The number of deaths was 41 (17 males and 24 females), including three deaths of non-residents. The corrected number of deaths is therefore 38, equal to a death-rate of 16·48 per 1000. The death-rate of infants under one year was equal to 3·5 per 1000; whilst the seven principal zymotic diseases were responsible for seven deaths during the year. The water supply was principally from the Fylde Waterworks Company, but the district in many parts derived its supply from wells, and there were still some houses without any supply. Cowsheds which had been inspected were reported as lacking in

drainage, ventilaton, light, and cleanliness; and there were structural defects in some of them. The report concludes with several suggestions by which sanitary improvements could be made, the principal being the carrying out of the proposed sewerage scheme with as little delay as possible; the removal of ashes, refuse, &c., and the provision of hospital accommodation for the isolation of infectious diseases.

The first annual report of the Nuisance Inspector (Mr. H. Fenton) follows the Medical Officer's report, and deals chiefly with the number of notices served and other sanitary matters. The report states that 23 new houses have been erected and certified for habitation since Mr. Fenton was appointed in May last.

INSPECTION OF MEAT IN GLASGOW.

Mr. A. M. Trotter, veterinary surgeon to the Corporation, has just issued his annual report. During the year, he says, the work of this department has been much augmented. Hitherto meat inspection was under the dual control of the Chief Constable and the Sanitary Inspector, but at the end of the financial year it was placed under my supervision. At that time an assistant veterinary surgeon and seven Meat Inspectors were appointed. This number, however, was found to be inadequate if the work was to be carried out in a satisfactory and efficient manner, and it was therefore considered necessary to increase the staff by the addition of two assistant veterinary surgeons and six Meat Inspectors. The tuition of the staff has required constant and careful attention, but these and other difficulties have in a large measure been overcome. From the 1st June to the 31st December there were slaughtered —58,375 cattle, 1244 calves, 184,588 sheep, 31,882 pigs, 15 goats; of these 1368 cattle, 158 sheep, 524 pigs were partially or totally objected to.

The most important disease, considered from a hygienic as well as from an economic standpoint, is tuberculosis. Of the 23,587 home cattle—oxen, bulls, cows, heifers—dressed in Moore-street, Victoria, and Milton abattoirs, the serous membrane of the pleural or peritoneal cavities of 1035, or 4·38 per cent., were affected; 328, or 1·39 per cent., were partially, and 707, or 2·99 per cent., were totally destroyed as unfit for human food. Of the 31,882 home swine, 481, or 1·58 per cent., were affected; 46, or ·14 per cent., were totally, and 435, or 1·36 per cent., were partially objected to. The disease was found localised in the 435 swine in the lymphatic glands of the throat, and consequently the head only was destroyed. During the period 34,788 cattle arrived at Yorkhill, and an examination of the viscera after slaughter showed that 25, or ·07 per cent., were more or less affected. Of these three (·008 per cent.) were totally, and five (·014 per cent.) were partially destroyed, whilst in 17 (·048 per cent.) the internal organs only were objected to. Three cases of anthrax were discovered, and were reported in terms of the Diseases of Animals Act, 1894. The carcases of five cows were objected to on account of the internal organs being affected with cancer. This disease is comparatively common in Irish cows.

It occasionally occurs that large numbers of cattle are landed from the Irish boats in a dead or dying condition. An instance of this took place on the 11th November, when the carcases of twenty-two animals were brought to Moore-street slaughter-house to be disposed of. The amount of meat annually imported cannot be ascertained with any degree of accuracy. Meat is brought into the city by rail, by river, and by road. From 1st June to 31st December 2449 visits were made to stations. Of the meat examined, twenty-five consignments, of the aggregate weight of 4337 lb., were found to be unfit for human food. These included five carcases of beef, seventeen of veal, and one of pork. On inquiry it was ascertained that the consignments in two instances were *mala fide*, and consequently legal proceedings were instigated against the consigners.

During the period under review 632 visits were paid to the various wharves, with the result that four carcases of beef and five of pork were dealt with. The cause of seizure was tuberculosis and decomposition, and entailed the destruction of 1536 lb. 7153 butchers' shops were visited, and in 269 instances meat was seized and destroyed. These seizures comprised 1897 lb. of beef, 235 lb. veal, 350 lb. mutton, 57 lb. pork, and 144 lb. sundries—in all, 2683 lb. Legal proceedings were instituted in one case, when the accused was found guilty and fined £3 3s., with the alternative of fifteen days' imprisonment. 124 visits were made to sausage factories, but nothing of an objectionable nature was detected. The dead meat markets were visited several times a day and the meat consignments examined. The majority of the meat salesmen have cordially assisted the Inspectors by acquainting them of country consignments arriving between their visits. During the year 1220 visits were made to cowsheds, and 13,919 milch cows were examined. The milk of fifty cows was temporarily or permanently withdrawn from circulation; nine permanently on account of tuberculosis, and eight for various other diseases. During the past few years the standard of dairy stock has much improved, and at present compares favourably with those of other parts.

National Health Society.

OFFICIAL TRANSACTIONS.

Chester Branch.—The following report has reached us of the works of the Chester Branch of the National Health Society:—"Owing to the branch having to bear its own expenses this year it was thought wiser to have only a six weeks' course of lectures, and it is satisfactory to be able to say that the interest in the work has not only been maintained but deepened and enlarged. At Knutsford, where lectures on 'Hygiene' had been given the previous year to excellent audiences, there was another course on 'First Aid,' which was equally well attended. Lectures were given at Upton on 'Elementary Nursing' and awakened much interest, more lectures being hoped for next year. At Burton Point another and succeeding course of 'Elementary Nursing' was given in the village, and was well and regularly attended. Isolated lectures on 'Bacteria' were given at Saltney, Chester, and at Carnarvon, to large and appreciative audiences. At Carnarvon the Guild Hall had been taken, and Dr. Griffith was in the chair, while at Chester Dr. Stolterfoth presided. In Chester itself lectures were given on 'Advanced Nursing' and 'Hygiene.' General interest has been aroused in the work of the Society, and the untiring efforts of the hon. secretary, Miss Williams, have resulted in a thorough recognition of the value of tuition on all health subjects."

Training Lectures.—The special course of Training Lectures will be resumed on Monday, April 15th, when Dr. Kenwood will give the eighth lecture of his course on "Public Health," at 53, Berners-street, at 4 p.m. Dr. Squire will continue his series of lectures on "Human Anatomy and Physiology," on Tuesday, April 16th, at 2 p.m., when the subject of his lecture will be the "Glandular System." The other lectures next week will be held at the usual hours.

The annual statutory inspection of Greenock Waterworks by the water trustees and millowners was made on the 1st inst.

Sanitary Inspectors' Associations.

YORKSHIRE.

A CONSIDERABLE number of the members of the Yorkshire branch of the Sanitary Inspectors' Association met in Leeds on Saturday, the 30th ult., to discuss matters relating to their important work. They came from Halifax, Huddersfield, Batley, Middlesbrough, Harrogate, Pontefract, Tadcaster, Burley-in-Wharfedale, and other towns in the county, whilst the sanitary staff in Leeds was represented by Mr. Darley and several others. Seven of the Leeds Inspectors were proposed as members of the Association. Mr. E. E. Lawson, chairman of the Leeds Sanitary Committee, entertained them to luncheon, and, on behalf of the Corporation, gave the visitors a cordial welcome. Mr. T. Pridgin Teale, who has long lent his valuable aid to the branch as president, afterwards took the chair in the Civil Court at the Town Hall.

Mr. LAWSON made a few remarks on the important part which the Sanitary Inspector plays in safeguarding the health of the community. Noticing the presence of a lady Inspector, he remarked that there was a considerable sphere of usefulness in connection with sanitation for women. The infant mortality, more especially in summer, was excessive, and it was largely ascribed to improper feeding. In dispelling the ignorance which prevailed in relation to feeding young children, the lady Inspector might render invaluable service. In instituting inspection, there was no desire on the part of the sanitary authority to interfere with domestic arrangements, and the public would do well to welcome the Inspector, and afford facilities for making his efforts as effective as possible. In a city like Leeds, where the clothing industry was extensively carried on, and where there were so many out-workers engaged in it, thorough sanitation was obviously of the greatest importance. He urged the members of the Association to maintain a high standard of efficiency, to avail themselves of the County Council lectures relating to their work, and to be patient and courteous in the discharge of their duties.

Mr. C. W. EVINGTON (Hull), chairman of Council, spoke on the work of the Association. It was desirable, he said, that it should be as representative as possible, and this it was rapidly becoming. The membership was increasing by leaps and bounds, and a sub-committee was considering the question of arranging a conference of their Association with the National Association with a view to amalgamation. Their Association had now 800 members, one-seventh of whom belonged to the Yorkshire branch, which had now been established over five years.

Mr. G. DARLEY, superintendent of the Leeds Cleansing Department of the Corporation, read a paper on the work carried on under his supervision during last year. It contained some interesting details. The area of Leeds is 21,572 acres, and the total length of paved streets 212 miles. During the past ten years the loads of house refuse collected have increased from 129,085 to 173,408 per annum. The cost of collection has risen from £17,621 to £24,675, and the rate per load from 2s. 8¾d. to 2s. 10d. No less than 72,836 tons in 1900 were sent to the four destructors, the cost of destruction being 1s. 10d. per ton. One of the greatest difficulties is the disposal of the clinker, about 38 per cent. of the original weight of refuse, or 28,000 tons. To make this into mortar a sale of 90,000 tons a year would be required. To utilise it in the making of concrete flags an enormous plant would be needed, and, of course, a large demand for the product. A portion of the remainder of the refuse is sold as manure. The rest is taken to market gardens or tipped elsewhere. In street cleansing 240 workmen, 70 horses, 44 carts, and 26 sweeping machines are employed. The whole of the centre of the city is swept nightly, and the wood pavement more frequently when required. Every night eighty-seven miles of streets are swept. It is impossible to keep wood pavement clean without washing, and it must be continually shingled. A combined sweeping and collecting machine is in use, but in collecting the refuse it also takes up the shingle and sand. An improved machine would be a great boon. The sweepings last year amounted to 39,629 loads. No fewer than 14,539 loads were removed from street gullies. The cost of the paved street cleansing was £20,369. The paper also gave information regarding the flushing of house drains. Mr. Darley sees no difficulty in adopting steam motors in place of horse-power for street sweeping. They will do the work in less time, and be available for other operations.

In the discussion which followed, all were agreed as to the advantage from a sanitary point of view of street sewer and house drain flushing.

Alderman LUPTON remarked that in Leeds a case of infectious disease in a slum street was in a sense a boon to the inhabitants of it, for there followed immediately after the case was reported a thorough flushing of the drains and sewers, and for a fortnight afterwards the street was in a pleasanter condition than it had been before.

Referring to street cleansing, Mr. LAWSON stated that last year Leeds adopted a system of absolute washing in the Leylands, but they had to considerably modify it in consequence of the need to economise the water.

Dr. Cameron, Mr. Travis (Halifax), Mr. C. W. Evington (Hull), Mr. Joseph Lindley (Batley), and Mr. G. H. Anderson (Middlesbrough) also took part in the discussion.

Votes of thanks were accorded to the Leeds Corporation for the use of the Civil Court, to Mr. Lawson for his hospitality, to Mr. Darley for his paper, and to the chairman for presiding.

A NEW FORMIC FUMIGATOR.

IN addition to those described in our issue of March 28th, another novel appliance, recently introduced by the Sanitas Company, Limited, is the so-called "Formic Fumigator," and it also has been designed for disinfecting sick and infected rooms and hospital wards with formic aldehyde, the vapour of which disinfectant is generated in its most active state accompanied by the most plentiful supply of steam. It consists of a specially-prepared absorbent block, which is heavily impregnated with a chemical compound of such a character that when heated, formic aldehyde is generated in abundant quantity, and there is superimposed over the block a small tank or vessel from which water or "Formic Renovator" fluid drips through a wick upon the heated absorbent block at the same time, thus securing the generation of steam and supplementing the quantity of disinfectant vapour. The Formic Fumigator is made in two sizes, selling respectively at 3s. 6d. and 5s. each. Now that formaldehyde is regarded by many scientists as the best gaseous disinfectant, and considering that its vapours are not destructive to furniture and metal work, as are vapours of chlorine and sulphurous acid, it will be a matter of surprise if this fumigator does not come into general use.

It will be gathered from these observations that the Sanitas Company, Limited, by no means confine their manufactures to their better-known Sanitas disinfectants and appliances, but are up to date in all that concerns the subject of disinfection and disinfectants, and we can heartily recommend our readers to obtain a copy of their descriptive catalogue for their more perfect information.

MUNICIPAL ENGINEERING & SURVEYING.

CROSS-TABLE CHAT.

There are some municipal surveyors who can write official and annual reports which are pithy, readable, and valuable. There are, however, a greater number who are unable to do so. The reports of Mr. J. S. Pickering, the Engineer and Surveyor to the Nuneaton Urban District Council, belong to the former category, and his report recently issued for the year 1900 contains, as is usual with all his reports, much food for thought for surveyors generally.

Mr. Pickering appropriately refers to the detrimental practice of employing hired team labour, as to which I have previously referred in this column, which prevails with his Council—as it does with a large number of Councils—and very properly says that "the Council can scarcely realise the inconvenience of having each day to procure team labour from seven different contractors living in various parts of the district. It is impossible always to arrange each night for the number of horses which may be required the following day, as the weather may necessitate an entire alteration of work. Consequently, much time is frequently wasted in getting the team labour actually on the work, and the workmen cannot always fully employ their time until this arrives. The work would proceed much more smoothly and more economically with the bulk of the horses ready at hand at the Council's depôt, and especially when scavenging the roads has to be undertaken, and the horses are most needed, they cannot be obtained at all."

Mr. Pickering might well have added, as I have from time to time heard other surveyors urge, that labourers accompanying the horses are as a rule inefficient and underpaid men, and that they fail to carry out a day's work equal to that carried out by men directly employed by the Council. By a simple computation Mr. Pickering shows the area of roadway which can be scavenged in a working day and the number of loads of mud which can be swept and collected from a macadamised road in the same period, assuming one tip van to be able to remove seven cartloads per day.

It appears that the Nuneaton Council have determined to adopt the bacterial system for the treatment of the whole of the sewage of the district, and it is pertinent to the question that Mr. Pickering estimates that when the work which is now in progress has been completed, a saving of £1000 per annum will be effected. Such a sum appears to be very considerable for a town of the size of Nuneaton, but Mr. Pickering is not in the habit of making incorrect estimates; moreover, he has gained considerable experience in the working of the system, and during the past year by a partial adoption of it a saving of £386 has been effected over the old chemical system of treatment, so that the figures may be taken as absolutely reliable.

Mr. J. W. Bradley, the newly-elected Borough Engineer to the City of Westminster, has our heartiest congratulations on his appointment. The post is one of the "plums" of the municipal engineering profession, the commencing salary being £1000 per annum, rising to £1200 in four years. Moreover, Mr. Bradley has thoroughly earned his promotion by dint of ardent devotion to work and a close study of all matters appertaining to the engineering sides of municipal administration.

Mr. Bradley obtained his first municipal engineering appointment under the Burnley Corporation. From there he went to Leicester, serving six years under the Borough Engineer, and thence he was promoted to the borough engineership of Meson (Lancs), subsequently going to Wolverhampton, where he has been Borough Engineer for the past six years, succeeding Mr. R. E. Berrington, the former Engineer, who is now a member of the Corporation of which he was formerly an official. Mr. Bradley has the credit of having designed, executed, or completed works costing over £1,000,000, and yet in no case have his estimates been exceeded, or has it ever been necessary to require an additional loan to defray the cost of work in excess of that estimated for.

Although comparatively still a young man he has travelled considerably and taken full advantage of his opportunities, having been in the United States and Canada and most of the European countries, acquiring information on municipal and electrical engineering matters, and under such conditions any municipal engineer can beat the home-keeping man whose knowledge and experience are crippled with the conservative idea that England and everything English is, and must be, the best in creation—a foolish error which should have been exploded long ago. In the final selection for the appointment, Mr. T. de Courcy Meade, the Borough Engineer of Manchester, Mr. J. Paton, Borough Engineer of Plymouth, and Mr. Bradley, were the chosen three. Mr. de Courcy Meade, it was believed, had considerable chances, and very considerable influence was brought to bear in his favour, but it speaks volumes for Mr. Bradley's qualifications that he was eventually appointed by forty-five votes to five. Senex.

THE SANITARY INSPECTORS' EXAMINATION BOARD.

The next examination for Certificates of qualification for Appointment of Sanitary Inspector or Inspector of Nuisances, under Section 108 (2) (*d*) of the Public Health (London) Act, 1891, will be held in London on Tuesday, the 7th May, and the four following days. Particulars will be forwarded on application to the Hon. Secretary, Wm. R. E. Coles, 1, Adelaide-buildings, London Bridge, London, E.C.

PRESENTATION.

On Thursday evening, April the 4th, Dr. Monk (late Medical Officer of Health for Leicester) was the recipient of a handsome present from the Sanitary Inspectors, who desired to show their esteem and respect to their Medical Officer on his leaving for Kimberley, South Africa. Chief Inspector F. Braley made the presentation, which consisted of a group photo of the Inspectors, with Dr. Monk as centre figure, also a meerschaum pipe, cigar and cigarette holder, which was suitably inscribed. Mr. Braley, in making the presentation, said that they all regretted the doctor's leaving, for he had always worked in harmony with them as head of the staff; he therefore asked Dr. Monk to accept this small token of esteem and best wishes for success in his new sphere of labour. Dr. Monk, in reply, thanked the officers for their kindness in presenting him with such useful articles, which he should prize very much, and in using them and looking upon the faces of those with whom he had worked so well, he should remember that much of the success during his term of office was due to their willingness and efficiency in their work, and he should always feel it a pleasure to speak of the good feeling that existed between the Inspectors of Leicester and himself.

NOTICES.

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The Sanitary Record
AND
Journal of Sanitary and Municipal Engineering.

APRIL 11, 1901.

THE CRUSADE AGAINST SMOKE.

THE annual report of the Coal Smoke Abatement Society is an admirable comment upon the excellent work performed by the same since its formation in March, 1899. Although the society at present only possesses one Inspector—a staff which we would remark is totally inadequate—no fewer than 2700 observations have been made on smoky chimneys in various parts of London. In 162 cases offences were proved and penalties inflicted, the fines so imposed amounting in the aggregate to the sum of £750. During the past year 1742 observations of offending shafts were reported to the Committee by this indefatigable officer, with the result that 1010 formal complaints were lodged, as the result of non-abatement, with the various Local Authorities concerned. As a result proceedings were taken in 125 cases, fines being inflicted to the amount of £494 13s. The salutary effect of this practical crusade against the smoke nuisance has naturally been very marked, and although we are still very far removed from the state of comparative perfection in this respect that we must work and legislate for, there is no denying that the nuisance is much less acute than formerly. The evils associated with the nuisance are so pronounced, and have been so often commented upon in these columns, that there is no need for reiteration; but the following two facts, instanced by Sir William Richmond, the president of the society, in the April number of the *Pall Mall Magazine*, may be cited as going to prove the need that exists for further determined action. The smoke cloud of London, Sir William tells us, is plainly discernible at Lockinge, sixty-four miles away, and in its passage overhead leaves a distinct residuum of black upon the soil. Again, in London itself, in the form of unconsumed fuel, a black cloud representing upwards of 6000 tons of coal, is in suspension every day. This wanton waste of fuel is in itself sufficiently serious to call for remedial measures, even apart from the great question of health, in which we are necessarily chiefly concerned. Harking back to the report, we find that the convictions previously referred to have had a salutary effect upon the various owners of trade furnaces, and, having thus learned that it is not within their province to allow their chimneys to belch forth black smoke to poison the atmosphere with impunity, they have in many cases taken steps to abate the nuisance. A good deal of ignorance, however, still exists as to the measures which ought to be taken to this end—ignorance which a perusal of a little threepenny booklet on "Smoke Prevention," by Mr. William Nicholson, Smoke Inspector, Sheffield, published at the office of this journal, would do much to dispel. There is still an idea that the excuse of not being able to procure Welsh coal will hold water, and those who advance it seem quite oblivious of the fact that in the section of the Public Health Act referring to smoke Welsh coal is not even mentioned. The only cure for this kind of ignorance lies in the imposition of still heavier fines, and when this is done the offenders will perhaps think it cheaper in the long run to take such measures as are at hand for the suppression of smoke than to pay their quota into the magisterial exchequer. In a former article on the subject we cited the instance of Nottingham, where the emission of black smoke is now practically unknown. The canny folk of the lace-making centre, when they discovered that the black smoke was playing havoc with their goods, soon set to work to find a remedy; and what

Nottingham can do can surely be done by London. In the meantime we consider the metropolis is under a great obligation to the Coal Smoke Abatement Society and to Sir William Richmond in particular, for their efforts to minimise a nuisance which is so injurious to the health of the community, and we venture to hope that the public appreciation of their efforts may take a tangible shape. Such a society should certainly not be allowed to languish for lack of funds to carry on its work.

A Prussian Rescript.

A FEW months ago we published some interesting details of proposed efforts to deal with the housing problem in Berlin. Since then the Prussian Ministry appears to have given special attention to the matter, with the result that there has just been issued a special rescript to the civil governors of all the provinces on Monday. The Berlin correspondent of the *Daily News* sent over a summary of this document, from which we learn that the Government starts from the principle that in the first line Municipal and District Councils are called upon to take the initiative in this matter, and only in cases where their measures prove inadequate must the State interfere. It is pointed out in the rescript that Municipal and District Councils have the moral obligation to provide all people in their employ with cheap and healthy dwellings, and to promote all endeavours to extend this benefit to the poorer classes in general. For this purpose the Councils can either themselves create building companies or support them. The preliminary condition, however, is that all these companies shall build small and cheap dwellings. It may be pointed out that this is only the extension of what is largely done by private firms in Germany. In most large concerns the workers are housed by the employers. The Government then proceeds to point out how the Councils might best carry out their task. They are to give financial assistance to building companies, either by subscribing for a considerable number of shares, or by loan at a moderate rate of interest, or, further, by the complete or partial abrogation of the dues for the making of streets and laying of sewers. But this payment must be made later on if the buildings are given up to other purposes. The building companies to which these facilities are to be granted must not pay a higher dividend per year than 4 per cent., the surplus being used for further investments. In case of the dissolution of the company the shareholders have only a claim for the nominal value of their shares. The Municipal and District Councils are further, if necessary, to give financial help by lending money on mortgage. Should the towns not have the money themselves, they may raise loans from the savings banks, or from the Imperial insurance offices, which have an enormous capital accumulated from the contributions to the old age, invalidity, and accident insurance at their disposal. This has to be done in such a way that the Municipal or District Councils are the debtors of the insurance office or savings bank, and the creditors of the building company to which they lend the money at a rate of interest of a quarter of one per cent. higher than they have to pay themselves. If circumstances let it appear expedient, the Municipal Councils can stand bail for the companies which borrow the money.

Help for the Contractor.

BUT it is contemplated that help may be given to individuals as well as companies; and the rescript goes on to state that the municipality shall grant such requests, but, of course, this can only be done on condition that the Municipal Councils have a guarantee in hand that the buildings will afterwards not be used for other purposes. In such case the Councils have the right of pre-emption at a nominal price. The Municipal Authorities, the Ministerial decree says, ought also to create adequate and cheap means of communication, so that the working population and the school children may be able without much loss of time to live outside the town. The building companies are also to have the advice of the building experts employed by the State and town free of charge, and they have not to pay the different taxes which, as a rule, are levied on the building of houses. As the present evils are chiefly due to unhealthy speculation in building land, the Ministerial decree suggests that the towns ought to buy up as much land in the neighbourhood as they can, in order to prevent it passing into the hands of speculators. The towns are then to sell the land or houses in their possession with small profit and on convenient terms to contractors who undertake to build cheap dwellings. The Ministerial decree finally points out that only by a co-operation of all factors concerned in the matter—State, towns, and employers—can a satisfactory solution of this most difficult problem be expected. It further suggests the creation of a central office in each province and the foundation of associations in single districts to be in permanent communication with the central office. Of course many of the proposals are peculiar to German methods of government, but they show that a decided effort is being made to grasp the difficulties of a pressing problem, and our own Government might do something in the same direction.

A Singular Difference between Experts.

THE well-known proverb of "doctors differing" received one of its most remarkable illustrations that we have seen for a long time in a diseased meat prosecution in Edinburgh, which was brought to a close last week. From first to last, between the first leading of evidence and judgment, the case was spread over several weeks. The charge related to two sirloins of beef, which had been sent to market for the purpose of sale, and intended for human consumption, and which were diseased, unsound, and unfit for food. Additional interest was imparted to the case from the fact that the meat was passed by the Glasgow dead meat Inspectors, although seized in Edinburgh,

and from the eminence of the experts called on both sides. For the prosecution, it was stated by a veterinary surgeon and Assistant Inspector of Markets that he had found the pleura and the peritoneum stripped to a large extent, for the purpose apparently of removing the tubercular deposits, of which, notwithstanding, there were traces. The meat was quite unfit for food. The evidence of several other Meat Inspectors was to the same effect. Dr. Shennon, Lecturer on Pathology, Edinburgh, said that he had found, on a microscopical examination, organisms which he thought undoubtedly tubercle bacilli. This evidence was corroborated by Professor Dewar, who also considered that the peritoneum had been stripped in order to hide something; by Principal Williams, of the New Veterinary College; and by Dr. Williamson, Chief Sanitary Inspector for the city. Dr. Williamson referred, further, to the instructions of the Local Government Board, that where the pleura are stripped the carcase must be seized. For the defence, experts of equal eminence gave it as their opinion that the meat was perfectly healthy. They included Professor Mins, Professor of Pathology in Glasgow University, and Dr. Welsh, Pathologist to Edinburgh Royal Infirmary, who both, while admitting the presence of organisms in the meat, were quite clear that they were not tubercle bacilli. The most singular evidence, however, was that of Mr. Trotter, Chief Veterinary Surgeon to the Corporation of Glasgow, who said that over 50,000 cattle were killed in Glasgow every half-year, and the meat inspection was carried out on the Belgian system, trained men being employed to examine the various portions of the animal. So strict were their examinations in Glasgow, that they were universally accepted, and he had never known of meat despatched from Glasgow being challenged. Mr. Trotter, however, went further. On hearing of the seizure of meat which had passed the Glasgow Inspectors, he went to Edinburgh and examined the sirloins. He found no evidence of tubercular nodules, or disease of any kind, but the surroundings, he said, were very dirty, and the table on which the meat was lying was so dirty that any organisms might have been on it. This was in the Edinburgh Sanatorium, and he declared emphatically that if he had kept his chamber in such a condition, he was afraid he would be reported to the Sanitary Inspector for having a nuisance. It was a serious charge to make. We wonder what the Edinburgh Sanitary Authorities will have to say in reply. The above is a bare *résumé* of the evidence, which was too voluminous to report fully. Seldom has a case arisen in which the evidence has been more conflicting, or in which the experts were more diametrically opposed. In his judgment, however, the Sheriff held that the evidence for the defence failed to shake that for the prosecution on the question of the presence of tubercle bacilli, which he considered to have been proved. At the same time he found the respondent to have established "that he did not know, and could not with reasonable care have known," the condition of the meat, and that he was entitled to a verdict of that nature. It may be mentioned that at the hearing of counsel, the Sheriff asked the counsel for the defence whether he would be satisfied with such a finding, but the latter maintained that the evidence he had led showed that the prosecution had been unjustifiable, and he pressed for an absolute acquittal.

The Early Closing of Shops.

When Lord Avebury moved for the appointment of the Select Committee which is now, under his chairmanship, considering the question of the early closing of shops, Lord Salisbury indicated that his chief objection was that it would unnecessarily curtail the convenience of the shopping public, especially among the poorer classes, and he hoped that the evidence to be laid before the Committee would adequately represent that large and usually voiceless class. Since then it has been noteworthy, not only at the sittings of the Committee, but in trade gatherings in various cities, that the feeling of the working classes, so far as it can be voiced by trade unions and similar organisations, is entirely in favour of a restriction of the present excessive hours in shops. The working classes as a whole are too sensible themselves of the blessings of liberty not to feel sympathy with the complaint of shop assistants that their long evening hours are both detrimental to health and deprive them of all opportunities for social intercourse, educational improvement, or recreation. Working men are perfectly ready to recognise that late shopping is due more to lack of consideration than necessity, and that earlier closing would not put them to any serious inconvenience. But even were it otherwise, is the inconvenience to which some people may be put to be weighed in the balance against the physical and social harm that shopkeepers and their assistants suffer on account of having to keep their shops open, under the stress of competition, to inordinately late hours? There surely can be only one answer to such a question.

The Responsibility of Public Analysts.

The certificate of a Public Analyst may be made the foundation of a criminal charge, and therefore it is all the more incumbent on him to exercise the greatest caution in every analysis, and in stating the results. But it would be most unfortunate, on grounds of public policy, if the possibility of error were to render him liable to a civil action of damages. This has been laid down by Sheriff Robertson, of Aberdeen, in a case of mistaken analysis which came recently before him. It arose out of a prosecution, under the Food and Drugs Acts, of an aërated water manufacturer, in respect of certain lemonade, which Mr. Thomas Jamieson, Public Analyst for the city of Aberdeen, certified to contain traces of lead. The sample was, at the request of the defendant, sent to Somerset House to be analysed, and the Government chemists reported that they had found a trace of copper, but not of lead. This,

of course, necessitated the withdrawal of the complaint; and the manufacturer, feeling aggrieved at the proceedings, and their publication in the newspapers, raised an action against Mr. Jamieson for £1000 damages. The Sheriff, however, has dismissed the action, remarking that the Analyst holds an impersonal position. Samples are sent to him for analysis, but he does not know whence they come. It is his duty to make his analysis to the best of his judgment, and send a certificate of the result to the Sanitary Inspector. There his duty ends. It is then for the Sanitary Inspector and his legal advisers to consider the advisability of a prosecution, which they bring if they think the facts will warrant it. The bringing of the prosecution, which was the thing that caused the damage complained of, did not rest with the Analyst, but with the Sanitary Authority and their advisers. In such circumstances, to hold that a public official who makes an analysis can be called on to answer a claim of damages without averring malice on his part, was quite unreasonable. In this connection we may remark that too great emphasis cannot be laid on the importance not merely of absolute accuracy in the analysis itself, but also of the correct statement of the result in the certificate, in which the most scrupulous care should be taken to adhere strictly to the statutory requirements. We have known several cases recently in which prosecutions have proved abortive on account of deviations in the mode of framing certificates from the statutory form, which might appear trivial to the Analyst himself, but are not so regarded by the judge. In proceedings under the Food and Drugs Acts, which are quasi-criminal, the very strictest construction is placed on the Analyst's certificate; and it is a most unpleasant position for a Local Authority to be placed in to be thrown out of Court on account of a technical informality.

Juvenile Smoking.

Among various matters referred to in the annual report of Dr. G. H. Butler, the Medical Officer of Health for Wealdstone, for the year 1900, is the growing evil of smoking among juveniles. He alludes to it on the ground that it is bound to have an influence for evil on the health of many individuals if allowed to proceed unchecked. It was quite a common thing to see young boys and lads smoking openly in the public streets. The sight in itself was objectionable, but became positively sad and painful when one considered the evil effects which indulgence in this habit by the young was sure to bring about. It caused premature undermining of youthful constitutions, and destroyed that healthy physical condition which was essential to the growth and development of a fine and strong race. Boys and youths who indulged in this habit could not expect to develop into men with nerves and muscles strong and fit to do their duty manfully in the battle of life—worthy sons of the Empire. It became a serious question whether legislative measures ought not to be passed to prohibit smoking among, and the supply of tobacco to, boys under sixteen years of age. At present no legal check or restriction whatever existed. No doubt the habit was generally contracted in ignorance of its baneful effects, and good might be done, the Doctor thought, if schoolmasters would make these known amongst boys under their charge.

Lady Sanitary Inspector for Middlesbrough.

As the result of the recent report of Dr. Dingle, Medical Officer of Health for Middlesbrough, upon the great percentage of infantile mortality in the borough, the Sanitary Committee have decided upon the appointment of a Lady Sanitary Inspector. We are glad to note that this decision has been approved by the Town Council. There is no doubt that much good will arise from the appointment of a Lady Sanitary Inspector, especially in the matter of instruction in the rearing of children. Her duties will be to undertake a house-to-house inspection in the poorest parts of the town, call attention where necessary to the importance of cleanliness, advise as to the rearing of children, the nursing of the sick, and the prevention of diseases. Most of the large towns have such lady officers, and their work amongst the poorer classes has been most successful, and such as to justify the Middlesbrough Corporation in making the appointment.

CORRESPONDENCE.

(*To the Editor of* The Sanitary Record.)

We do not in any way hold ourselves responsible for opinions expressed by our correspondents.)

THE HOUSING OF THE WORKING CLASSES.

Sir,—The housing of the working classes is a question which illustrates the need of method and concentration in social reform to which I recently referred in your columns. We require systematic treatment of the facts, the law, and the administration of the law.

First as to the facts in London and the country. If we could obtain systematic information as to the evils which exist, no doubt in many cases reform would follow at once by the action of public opinion. Only last year it was discovered that some of the worst property in London was owned by the Lord Lieutenant of one of the Midland counties, and some by a curate of a London church. The registration and publication of the names of the owners and occupiers of insanitary property would be the first step. What is true of London is even more true of the country. The owners have in many cases no idea of the condition of their cottages. The newspapers are sometimes taken to task for sensational statements about housing, but could any statements be stronger than those of the late Mr. William Little and Mr. Wilson Fox (now editor of the *Labour Gazette*), after a careful official inquiry in the rural districts? Mr. Little said that "a large proportion of the cottages are below a proper standard of decency and comfort; many of them are vile and deplorably wretched dwellings." Mr. Wilson Fox stated that "many houses are more fitted for animals to inhabit than men and women, and in which no human being could be either happy or contented." These two gentlemen, whose inquiries are borne out by subsequent writers, down to the present year recommended as a remedy that the owners of all houses let at a rental of

less than £10 a year should make a return to the Sanitary Authority every year stating the number of persons in each cottage, their sex and age, whether the house is provided with a proper water supply and sanitary accommodation, and whether the premises are in good repair. I moved for such a return in the last Parliament; but the Government refused it, and I think they incur a heavy responsibility if they take no further steps in the matter after refusing to carry out the principal recommendation made by two such experienced and practical men as Mr. William Little and Mr. Wilson Fox as the result of an exhaustive inquiry.

But, turning from the facts to the law, the next question is that of codification. The Housing of the Working Classes Act of 1890, and the London Public Health Act of 1891 were a great step towards consolidation; but the question now is whether it would not be possible to consolidate the whole of the laws relating to the public health; for the Housing of the Working Classes Acts are only a chapter, though a very large and important chapter, of that legislation. Whether this is possible or not, it is most desirable that an authoritative digest of the law on housing, of which there has been some talk, should be published by the Local Government Board, and also an abstract, like the abstracts of the Factory Acts, which could be not only circulated to the Local Authorities, but posted up in insanitary districts when necessary. After the law come the administration and the control of the administration. The administration of the Housing Acts is in the hands of the Local Authorities, who have been very supine in the past, and act largely through medical officers, who have no fixity of tenure of their offices and are for the most part miserably paid. Six hundred and eighty-four, or more than one-third, of these officers receive £30 a year and under, eighty-four of them receive £20 and under, no less than fifty receive £10 and under. Public opinion would have to be directed to remedy this scandal systematically. A man who receives £3 a year, as in one case, cannot be expected to carry out such important and invidious work adequately. But when all is done that can be done by the Local Authorities, it seems that some central supervision may be found necessary. There is no doubt that surprise visits by travelling Inspectors would do a great deal to awaken local interest. These would be appointed by the Local Government Board and by the Home-office, but we may hope some day to see all the Acts relating to the public health under one central department.

After the question of administrative control by a superior department comes the question of judicial control by the Courts and legislative control by Parliament. Under the first head arise questions like conflicts between authorities. These drag on from year to year from want of a proper system of administrative justice. The uncertainty which exists in matters often of life and death, and the delays incidental to decisions in the ordinary course of justice, lead one to ask whether the time has not come to add an extra Judge to the High Court to deal with such business. In the long run we shall no doubt have to face not only the problem of a careful delimitation of the spheres of action of local authorities, but also the very important question whether, having in 1834 adopted the foreign system of paid professional officials for administrative work, we can much longer defer the organisation of a proper system of administrative justice.

After judicial control comes the control of Parliament. Here it is not generally known that Parliament has so successfully decentralised the question of housing that, except on the narrow question of audit, the problem of housing cannot be raised on the Speaker leaving the chair when the House goes into Committee on Civil Service Estimates or on the Civil Service Estimates themselves. In view of the ever-increasing obstacles placed in the way of the action of private members in moving resolutions or introducing Bills, practically their only method of exercising control is the unsatisfactory one of questions. This seems to me a fact to which attention should be drawn; the remedy for the evil can only be applied by members of Parliament, and I have already trespassed too much on your space to make any suggestions in the matter.—I am, yours faithfully, GEOFFREY DRAGE.

THE UTILISATION OF SEWAGE.

A PAPER on this subject was recently read at a general meeting of the Institution of Civil Engineers, Dublin, by Mr. Marmaduke F. Purcell. The meeting was held in the rooms of the Institution, 35, Dawson-street, the President, Mr. Edward Glover, presiding. There was a large attendance of members.

Mr. PURCELL, in the course of his paper, said: The problem besetting every engineer dealing with sewage drainage is how, when he has collected the sewage, he is going to get rid of the solids contained therein. This is comparatively an easy matter in the case of small towns situated on the seashore, but becomes more perplexing in accordance with the increased size of the town or city which has to be dealt with, as in the case of large deposits being sent out with the tide, there is always the danger, almost the certainty, of such deposits being swept back to a large extent, and re-deposited on the foreshore, there to become a nuisance and a danger, to say nothing of being a waste of valuable material. Then, as we go further inland the problem becomes more pressing, for you must either pollute your rivers, again losing matter of value, or you must treat it as a manure, and sell the sludge or cake to the farmers, or else utilise it on sewage farms. Both these latter alternatives have their respective values, and also their striking disadvantages. The question of sewage farms is one which I do not feel myself competent to enter into, but I understand that to be effective the area must be great, so as to get the acme of efficiency, and the sludge should be dug in, and the ground left fallow for three years to obtain the best results; consequently, in any up-to-date sewage farm, you could only have one-third of it under cultivation in any one period; but there is a much graver aspect of the sewage-farm system, and that is the indestructibility of disease germs by the ordinary methods of precipitation employed at depositing stations, and the absorption of such germs into the cellular tissues of the vegetables grown on such farms, and their transference in the course of their use to the human body, and the resultant spread of such diseases as typhoid, &c. This alone should lead us to do all we could to utilise in some other way the valuable asset that every community produces, which many throw away, others misapply, and all would like to recover. But the question is how to do this efficiently and economically; how to produce value where at present we have loss and danger. These were the questions that presented themselves to my mind some years ago, and to which I endeavoured to get a satisfactory answer. I knew that many workers before me had gone into the same field and retired baffled and disheartened. In the course of my investigations I came to the conclusion that in place of looking for and dealing with a single resultant of the quartette that may be derived from the sludge deposit, the only thing for an economical working would be to obtain all four (main) products, and that, if possible, at a single operation. My object is the distillation of the filter-pressed sewage obtained from any sewage disposal works where the use of filter presses is adopted, and

assuming the cakes of sewage can be obtained first hand, and in such a condition as to bear transit, then the process has for its ultimate object the production of oil, ammonia (as ammonia water), and a solid residue which is to be converted into cement—for which purpose it is admirably fitted, especially where lime has been used as a precipitant in the separation of the sewage into sludge and effluent, as is the case in London. The paper then gave the results of an analysis of the London sludge, and went on to state that it was found that by simply drying the sludge it would give a body capable on distillation of yielding very large amounts of ammonia, and also an oil which would be of value as a carburetting material in the manufacture of gas. It is evident that if the compressed sewage can be obtained from the sewage works for the simple cost of transit, or at a nominal cost, or utilised by the Authorities on the spot, and that by distillation it can be made to yield a high percentage of ammonia, and also give oil, and a valuable residue in the form of cement, then a very valuable return will be made by treating such material.

Mr. James Dillon said Dublin was spending enormous sums in completing a main drainage system, and there was every hope that in bringing down the sewage to the Pigeon House the scheme would be fairly successful. But when they had got the sewage to the Pigeon House it would be necessary to have extensive works to enable the sludge to be collected and filled into ships of a peculiar kind at all seasons of the year, and he was afraid there would be some difficulty experienced in taking it out to sea in stormy and severe weather. If Mr. Purcell's system turned out to be successful an enormous sum would be saved in the cost of ships, because all that it would be necessary to do would be to construct works such as Mr. Purcell had indicated in his paper. He hoped the Corporation would give the method recommended in the paper an honest and fair trial, with the object of cutting down the cost of dealing with the sewage in the way originally intended.

After a few observations from Mr. Dick,

Sir Charles Cameron said the subject dealt with in the paper was a very important one, quite apart from the particular scheme for disposing of sludge which the paper brought before them. It was a matter of great importance to be able to deal economically with the immense quantity of semi-solid matter which had to be dealt with in the case of a large city like Dublin. There was no doubt that when the sludge produced was conveyed out to sea, there was no return of any value whatever for the labour bestowed upon the disposal of it. The country was not enriched by the production of any one article. There was no material for the making of cement, and no material for manuring their fields. If by treating the sludge differently they could get out of it something of value that would be a gain to the country at large, because they would have something to put on their fields and use it in their industries. He thought that was the idea that ran through Mr. Purcell's paper, that they ought to do something with the sludge, even if in treating it in the way he indicated it would be necessary to spend a larger sum per ton than it would cost to send it out to sea, for the simple reason that they would obtain something in return for the expenditure. He was quite satisfied if in Dublin they could send a clear liquid out to the sea, no matter how much dissolved organic matter it might contain, for they were never likely to see any solid matter from it. That, however, did not affect Mr. Purcell's theory. It would, in his (Sir Charles Cameron's) opinion be much easier to treat the sewage of Dublin as that of a town upon the sea than as that of an inland town. But, in any case, whether a town was on the sea or inland, there would be a large quantity of matter precipitated. He thought there was a great deal in the paper as regards the proper way to treat sludge. In Dublin some thought they ought to carry it out to sea. Another proposal was that the sludge, when sufficiently compressed, should be used to reclaim the foreshore along the Pigeon House Wall. The foreshore there was certainly anything but salubrious; it was most offensive very often. There was an idea that this compressed sludge might be used to reclaim a portion of the foreshore along the southern side of the Pigeon House Wall. He thought there was a good deal in Mr. Purcell's paper, though he was not quite prepared to say that all his calculations would come out in actual practice. It would, in his opinion, be well worth while to give a trial to the process brought before them in the paper. It was not necessary that any great expenditure should be incurred in doing so. The process was so comparatively inexpensive that in the case of Dublin he believed it would be well worth while to give it a trial, and see what were the products per ton that could be obtained from it, and whether it would be cheaper than the system of carrying the sludge out to sea.

Other speakers addressed the meeting.

Public Works.

SEWERAGE.

The Darfield Urban District Council is obtaining a loan of £9856 for the sewage scheme.

Further works of sewerage, estimated to cost some £20,000, are to be carried out in the urban district of Gorton.

Sanction has been obtained by the Heaton Norris Council to borrow £5720 for purposes of sewerage and sewage disposal.

The Leek Rural District Council has called in Mr. J. E. Willcox, C.E., of Birmingham, to advise it with respect to the sewage disposal of the district of Endon.

A Local Government Board inquiry has been held at Tring with reference to an application by the Urban Council for sanction to borrow £5500 for works of sewerage and sewage disposal.

The Broadstairs and St. Peters Urban District Council have decided to borrow £10,000 for works of sewerage, the enlargement of the Council offices, paving of streets, and the laying out of a pleasure ground.

The Clerk to the Rural District Council of Crickhowell has been instructed to write the Local Government Board urging it to hold an inquiry in connection with the Llangattock water and sewerage scheme as early as possible.

The Boston Town Council has instructed its Surveyor to prepare a report as to a pumping scheme for the drainage of a portion of the west side of the town, and to submit an estimate for a destructor. It has been decided to purchase disinfecting apparatus at a cost not exceeding £100.

A special meeting of Morpeth Town Council was held last week to further consider the question of the sewage disposal scheme. The Town Clerk (Mr. F. Brumell) brought up a report from a Committee of the whole Council, which stated that the whole position had been re-considered, with the advice of Mr. Balfour, jun., of Messrs. D. Balfour and Son, engineers, Newcastle. The report having been read, the Council resolved that in view of the plans amended by Messrs. Balfour in accordance with the suggestions of the Local Government Board, the Council would proceed with the whole works proposed, and apply to the Local Government Board for a loan to enable it to do so, including the pumping of the sewage and dry-weather flow on to the irrigation ground on the Parish Haugh.

Colonel Dunford, R.E., held a Local Government Board inquiry at New Mill, near Holmfirth, recently, into the application of the New Mill District Council for sanction to borrow £12,550 for a scheme of sewerage and sewage disposal. Mr. Sam Shaw, C.E., of Dewsbury (the Council's engineer), and the Chairman and Clerk gave evidence.

The London County Council has agreed, on the recommendation of the Local Government and Taxation Committee, that it be empowered to take all necessary steps for the protection of the Council's interests in connection with the hearing before the Privy Council of the petition of the Friern Barnet Urban District Council against the Hornsey drainage scheme.

At a recent meeting of the Works Committee of Dundee Town Council, the drainage of the outlying portions on the north side of the city was discussed. A plan showing the proposed main sewer was submitted, together with the notice thereof. The Committee approved of the plans and sections, and authorised the same to be executed. The cost is estimated at £2800, but under agreement with Sir Reginald Ogilvy, Bart., and Mr. Erskine, of Linlathen, these two proprietors make contributions to the expenditure for ten years equal to about £40 per annum, while owners and occupiers outside the burgh, representing 60 per cent. of the extent of the sewer, would have to pay a rate of 6d. per £1.

The Edinburgh Burgh Engineer has prepared a report on the Craigentinny Meadows irrigation scheme, in which he recommends that irrigation should be continued in the Meadowbank district, and that a 7ft. 6in. culvert should be made from Craigentinny Meadows to Piershill Station, and a 7ft. culvert from there to London-road to carry off the drainage. The normal flow in the sewer is about 800 cubic feet, but in spates the flood waters and the sewage together amount to about 18,000 cubic feet or thereby. The length of the culvert required from its present termination to Craigentinny Meadows—that is to say, the length of the open burn requiring at once to be covered in—is 1200 yards or thereby, and would cost, irrespective of way-leave, £10,000 or thereby. Mr. Cooper thinks that irrigation might for the present be continued at Craigentinny Meadows.

Last week at a meeting of the Ribble Joint Committee at Preston, Alderman Burrows said that Burnley had spent a tremendous amount of money in endeavouring to improve their effluent. In trying to meet the wishes of that Committee they had incurred a rate of 9½d. for a town of about 10,000 inhabitants. The Local Government Board required them to have so much land for filtration purposes, but they had found that by putting down bacterial beds, or filters, they were able to deal more effectually with the sewage, and that the effluent was of a purer character than when it went over the land, which became choked. Dr. Ferguson informed the Committee that the Corporation of Burnley had already bought 63 acres of land, which had cost, with drainage, £400 per acre, and they had found that an acre would only take 8000 gallons of effluent. Their daily outfall was two million gallons, and this meant a much greater outlay than they had even made already. By the bacteriological system they found that one acre would deal with 250,000 gallons, which meant that eight acres would be sufficient to cope with their daily flow of sewage, and be a saving of money and labour. He moved "that a report be made to the Local Government Board that the work of the Local Authorities dealing with their sewage effluents, where their present works are insufficient, to prevent serious pollution of the rivers under the control of that Joint Committee, will be much facilitated if the Local Authorities are allowed to borrow capital for works of purification of sewage by bacterial means, unaccompanied by any stipulation requiring the acquisition of land for further filtration in cases where they are prepared to take their chance of the works proving efficient." The report was adopted unanimously.

WATER.

The Tees Valley Water Board has approved the issue of precepts to the amount of £24,000 upon the Corporations in the following proportions:—£12,000 on Middlesbrough, £10,000 on Stockton, and £2000 on Thornaby.

The Local Government Board has sanctioned the borrowing by the Keighley District Council of £1000 for the purchase of the Redcar and Whitefield waters, and the laying of pipes, but only on condition that a certain length of pipes be laid under the road should be of iron and not of pot.

The contract for the Bewdley water supply has been secured by Mr. W. H. Reading, contractor, of Molineux-street, Wolverhampton. The contract amounts to nearly £11,000. Mr. R. E. W. Berrington, of Wolverhampton, is the engineer of the scheme, which is to supply the whole of Bewdley with water to be obtained from a well and then pumped into a reservoir.

At the last monthly meeting of the Oystermouth Local Board a report of a Committee was adopted which stated that, after carefully considering the analyses of water made by the county laboratory and a letter from the Local Government Board, the Committee recommended that the questions of the company's responsibilities as to supply and purity be tested under the Public Health and Waterworks Clauses Acts.

We understand that there is unbounded satisfaction at Workington that the Corporation has at last cast aside its supineness in regard to the water supply, and has resolved to carry out the scheme for the laying of a second pipe from the lake, whereby the people will have a permanent supply of water. The scraping of the main from the lake to Workington is not yet completed, but on all hands the verdict is that it will not meet the needs of the town and district. The new works are now making rapid progress, the contract for the supply of pipes will shortly be placed, and it is calculated that the entire scheme will be completed in eighteen months.

At the last meeting of the retiring District Council a letter was read from the Local Government Board with regard to the proposed water supply for the parishes of Bridgwater Without, North Petherton, Huntspill, Chedzoy, Puriton, and Bawdrip. The Board asked for particulars as to the scheme, estimated to cost £30,000, and also for the proportionment to be made of the cost on the various parishes included. It was decided to hold a special meeting a month hence to consider the question of apportionment, and in the meantime to inquire from the Local Government Board what was the course usually adopted. The estimate was presented and passed, showing a slight increase over the past half year.

The Gas and Water Committee of the Birkenhead Corporation is recommending the Council to accept the offer of Messrs. R. F. Craig and Co., Limited, Paisley, to supply, erect, and fit up complete, at the Ford Waterworks, two sets of air-lift apparatus and pumps, capable of raising 16,000,000 gallons per week from a depth of 780ft. in the borehole, and delivering the same into the tank on the water tower at Flaybrick Hill. It is urged that, as the question of the water supply to the borough is of pressing importance, the contract should be entered into without delay, in order that the supply of water at Ford Waterworks may be utilised to a fuller extent than has hitherto been possible, and to meet the increasing consumption of water in the area supplied by the Corporation.

Dr. Best recently gave an instructive address at the Liberal Club on the question of the purchase of the Louth Waterworks by the Corporation. His argument was that the present worth of the waterworks undertaking was about £9000, and yet the Highways Committee of the Corporation had unanimously recommended its purchase at £15,000, and this recommendation had only been defeated in the Council by a majority of one. He showed that at the present time only one-third of the people of Louth were using the water, and he argued that it would be quite unfair and most unjust for the other two-thirds to be compelled to pay their share of the cost for the benefit of the other third. He also showed that the income of the company was ridiculously small, and that its £10 shares in the open market realised under £5. The original cost of the undertaking was about £20,000.

After repeated and vexatious delays, the scheme for bringing in an improved supply of water for East Looe is now practically settled, and will be proceeded with at once. At a special meeting of Looe Urban Council last week, convened for the purpose of determining the method of proceeding with the work, Messrs. S. W. Jenkin and Son, of Liskeard, the engineers, reported that they believed all the conditions and requirements of riparian and other owners had been at length satisfactorily settled. After discussion, it was resolved that the Council itself purchase the pipes and valves, and the Clerk was instructed to obtain tenders from firms approved by the engineers, and that tenders for laying the mains and constructing the reservoir be invited as soon as possible. The new works for the West Looe supply are now approaching completion, and the works now to be proceeded with will form the second section of a comprehensive scheme interchangeably available for both places.

In view of the proposed purchase of the Louth Waterworks undertaking by the Corporation, it is interesting to find, says the *Lincoln Mercury*, that so early as 1854 the question of public water supply led to the passing of an Act of Parliament (17th Vict., cap. 51). The promoters appear to have seen Messrs. Samuel Trought, John Hurst, Thos. Young, Cornelius Parker, John Booth Sharpley, Archibald Dymock, William Henry Adams, and Herbert Ingram. The Act known as "The Louth Waterworks Act, 1854," provided for the incorporation of a company for supplying water within the parishes of Louth, Hallington, South Elkington, Louth Park, and Keddington. The capital was to be £12,000, in 480 shares of £25 each; and there were to be nine directors, namely, the eight above named and Mr. Henry Munt. The Act does not state what sources of supply the company were to have access to. As the undertaking does not appear to have become established, it would be interesting to learn why it fell through. The present company's Act is dated 1871.

LIGHTING.

The London County Council has agreed to lend the Stepney Borough Council £10,000 for electric light installation.

A Local Government Board Inquiry was held at Southend last week with reference to the Town Council's application for sanction to borrow £40,030 for the purposes of electric lighting.

The installation of the electric light at Grays will, it is expected, be completed by the end of August. The Urban Council has decided to give the Gas Company notice to terminate their contract on June 30th.

A Local Government Board inquiry has been held in Bleckheaton in reference to an application of the District Council to borrow £25,000 for the purpose of electric lighting and the provision of a refuse destructor.

Dartmouth Gas Company has issued its annual report. From it it appears the cost of coal has been £600 more than last year, and the directors are not prepared to recommend more than a dividend of five per cent. For many years past the shareholders have received ten per cent.

Considerable advances have been made in the electric light scheme at Worthing, which is being carried out at a cost of more than £30,000, and an expenditure of close upon £6000 is contemplated at the corporation baths, medical baths being an important feature of the proposed provision.

The extensions at the Coatbridge Gasworks, which cost £20,000, are worthy of note, in so far that the new holder, weighing 200 tons, instead of having pillars and girders, has rails and pulleys, on which it moves up and down. This method is quite new, and the patent rights have been secured by Dempster, Limited, of the Langloan Ironworks.

By the end of September we understand the Hackney Borough Council expects to be in a position to supply electric light. In order to secure a large demand it has decided to enter into an agreement with a firm for the free wiring of consumers' premises at a rate not exceeding 2s. per lamp installed per annum. The Committee discovered that it had not the power to do this work itself unless paid for out of the current rates.

The Morecambe District Council held a special meeting last week, in committee, to complete the arrangements for formally acquiring and taking over the Gas Works from the Morecambe Gas and Light Company, Limited. The solicitor to the Gas Company, delivered the said conveyance to the Council, and received in exchange for the same the foregoing mortgages amounting to £141,000. He also handed to the Council a receipt for the sums of £1104 15s. 6d. and £5895 4s. 6d. in exchange for the said mortgages for £7000.

The Holborn Borough Council has written the Kensington Borough Council stating that it has considered the resolutions passed at the conference of local authorities held in October, 1900, by the London County Council and the Corporation of London on the subject of the charges for gas, and approved of the taking of active steps by the latter authorities to protect London gas consumers and to oppose the grant by Parliament of further powers to metropolitan gas companies unless and until due redress of the existing grievances be obtained.

GENERAL.

The Wilton Town Council has decided to adopt the Wash-houses and Baths Act.

The Eastbourne Town Council has decided to build a branch public library and baths at seaside at a cost of £2000.

The Stafford Town Council has received the sanction of the Local Government Board to the erection of artisans' dwellings.

The Hanley Town Council has accepted the offer of the Horsfall Destructor Syndicate to provide a refuse destructor for £5000.

The Woolwich Borough Council has selected a site in High-street, Plumstead, for the erection of a public library, baths, and other municipal buildings.

A Local Government Board inquiry has been held into the application of the Royston, Ashwell, Melbourne Joint Hospital Board for a loan of £3000 for an infectious diseases hospital.

The Glasgow Health Committee, after considering a report by its Health Officer, has resolved to take no action with reference to the Trades Council letter alleging danger to the health of the community by drinking aërated waters from glass-stoppered bottles.

The London County Council has decided to lend the Hampstead Borough Council £4385 for a dust destructor, and the Battersea Borough Council £3615 for building and paving works.

Although it is rather late in the day, the industrial burgh of Clydebank is stirring itself on the question of an ambulance corps. It is hoped that the nucleus of this necessary movement will be found in the Kilbowie ambulance class, and a committee has been appointed to confer with the employers of labour on the question. Besides the necessary appliances, a wagon will also be aimed at, as there is no public one in the burgh, although the shipyard and the factory both possess these conveniences.

At a recent meeting of the Cleansing Committee of the Aberdeen Town Council the offer of Messrs Scott and Son, amounting to £162, and of Messrs Twyfods, Limited amounting to £161, was accepted for the reconstruction of conveniences at Flour-mill-lane and Short Loanings. In connection with the proposed purchase of a refuse destructor at the police stables, the Committee resolved to visit the Esplanade and ascertain the amount of refuse that could yet be deposited there, so as to enable them to present a report on the whole question to the Council.

As previously announced, a British Congress on Tuberculosis, of which King Edward is patron, will be held in the Queen's Hall, London, from Monday, July 22nd, to Friday, July 26th, this year. The work of the Congress will be divided into four sections, as follows:—(1) State and Municipal, presided over by Sir Herbert Maxwell, M.P.; (2) Medical, including Climatology and Sanatoria, Sir Douglas Powell presiding; (3) Pathological, including Bacteriology, president, Professor Sims Woodhead; (4) Veterinary, tuberculosis in animals, president, Sir George Brown. Public addresses will be given to the whole Congress on July 23rd, by Professor Koch, of Berlin; on the 24th, by Professor Brourdel, of Paris; and on the 25th, by Professor McFadyean, of the Royal Veterinary College. The Earl of Derby has intimated his desire to receive the members at an evening reception to be given by him.

At the last monthly meeting of the Carnoustie Town Council a voluminous correspondence was submitted on the question of an emergency hospital for small-pox, free re-vaccination, and a permanent infectious diseases hospital. The Local Government Board requested plans of the proposed hospital, and urged that free re-vaccination be at once offered. Regarding the proposal to use two houses in Yeaman-street for the isolation of small-pox, the Board expressed the opinion that the proposal seemed a highly dangerous one, and requested a report thereon from the Medical Officer. Dr. Dickson thereupon reported that the houses in question were not suitable, and proposed the immediate erection of an isolation hospital. The Town Clerk of Monifieth also inquired the views of the Town Council of Carnoustie upon the question of a combination hospital for small-pox. Subsequently Dr. Dickson reported his preference for a site for the infectious diseases hospital on the Carnoustie estate behind Viewbank, instead of at Pitskelly, as formerly advocated and elaborately reported upon. In reply to a question whether small-pox cases could be treated in an infectious diseases hospital, the Local Government Board stated that that could be done only when all other infectious cases are excluded. The minutes of the Committee were approvod.

The St. Bride's Press, Limited, 24, Bride-lane, Fleet-street, London, E.C., are about to publish a work on "Quantities," by J. Bartlett, M.S.A., member of the Council of the Society of Architects. Vol. I. (ready April 15th) deals with quantities as applied to road making and sewer construction, and should prove extremely useful to surveyors, municipal and consulting engineers, contractors and others. It will be on sale at 10s. nett.

PERSONAL.

Mr. T. B. Young has just been appointed manager of Dollar Gasworks.

Mr. Maxwell has been reappointed Surveyor for the rural district of Gainsborough.

Mr. Leonard Gibson has been reappointed Inspector of Nuisances for the urban district of Hessle.

Mr. P. M'Farlane Cram has been appointed Road Surveyor and Sanitary Inspector for the county of Nairn.

Mr. Simmonds has been re-appointed Inspector of Nuisances for Eaton at a salary of £62 10s. per annum.

Dr. F. J. Sadler has been appointed Medical Officer of Health for the rural district of Barnsley, at a salary of £40 per annum.

Dr. H. Ruskin Hancock has been appointed Temporary Medical Officer for the Leicester Isolation Hospital, in room of Dr. Monk.

Dr. T. Bamford has been appointed Medical Officer of Health for the rural district of Uttoxeter in place of Dr. Herbert, resigned.

Dr. P. E. Hill has been appointed Medical Officer of Health for the rural district of Crickhowell, at a salary of £50 per annum.

The Local Government Board has sanctioned the appointment of Mr. Ransome as Medical Officer of Health for Southgate for the next year.

Mr. Marshall, of Fenton, has been appointed Sanitary Inspector and Road Surveyor for the urban district of Uttoxeter, at a salary of £140 per annum.

The salary of the Surveyor and Gas Engineer to the Great Malvern Urban District Council (Mr. H. P. Maybury) has been increased from £450 to £600 per annum.

Dr. Williamson and Dr. Cheetham have been reappointed Medical Officers of Health for Wharfedale, and Messrs. Slater and Morfitt Sanitary Inspectors.

Mr. J. W. Bradley, Borough Engineer of Wolverhampton, has been appointed City Engineer and Surveyor of Westminster, at a salary of £1000 per annum, rising to £1200 in four years.

Dr. R. H. Townend, of Skelmanthorpe, has been reappointed Medical Officer of Health for the urban district of Emley, and Mr. Mountain has been appointed Inspector of Nuisances.

Dr. Robert Smith, who graduated in 1894 and took the diploma in public health in 1899, has been appointed Medical Officer of Health to the borough of Rawtenstall, with a population of 32,000; and Dr. Robert S. Trotter, has been elected to the Medical Officership of Bedlington.

OBITUARY.

DR. MURRAY MACKAY.

A highly respected North Shields medical man in the person of Dr. Murray Mackay died at his residence in Northumberland-place on Thursday, the 28th ult. He came from Fifeshire to North Shields fourteen or fifteen years ago, and was subsequently for a long time one of the Medical Officers for the Tynemouth Union. He was only confined to his house a week before he died, so that the news of his death came as a surprise to many. The deceased leaves a widow and family.

LAW CASES.

Interesting Smoke Prosecution.

The Times Mill Company, Limited, Tonge Springs, were summoned by the Middleton Corporation for smoke nuisance. The fact that an order had been made on the company having been proved, Mr. Norton said he took an observation of the defendant's chimney on February 25th from 2.10 p.m. to 3.10 p.m., when there were 14 min. 35 sec. black smoke, 20 min. 42 sec. moderate, 21 min. 58 sec. slight, and 2 min. 43 sec. no smoke.

Mr. Wardle (manager): You remember that day seeing our smoke-preventing appliances?

Mr. Norton: I don't admit they are smoke preventing.

But you know that the construction of the fire-bars is such that the man cannot coal heavily?—No, I do not. He can fire heavily if he wants.

Do you remember that when you saw them the fires were burning brightly?—Yes.

And do you know when they burn brightly like that you cannot make black smoke?—You can if you put coal on.

Mr. Norton added that the Corporation did not wish to be hard, but this was about the worst chimney in Middleton. This was rather singular, because it used to be one of the best. Up to recently there was very little trouble with the chimney.

Mr. Ramsbottom: You have a time limit?

Mr. Norton: We allow them ten minutes in the hour. Very few Corporations allow such a length of time as the Corporation of Middleton. I don't think they can complain as to that. It is not economy for them to send up black smoke, because it is unconsumed fuel.

The Chairman: In the eyes of the law there is no such thing as a time limit for black smoke.

Mr. Wardle said the firm had done all they could do, and gone to great expense with smoke-preventing appliances. They had a guarantee from the man who put in the present appliances to pay all fines if the other boilers using the chimney had the same appliances on. Mr. Wardle said they could do no more. It was really painful to be brought there nearly every week, and it looked malicious.

The Chairman: The law is there, and we have to administer it. The Bench have decided to fine you 10s. and costs. Seeing both firms used one chimney, it would be better for one of you to build a new one.

The Middleton and Tonge Cotton Spinning Company were fined 10s. and costs.

Temperature of Workrooms.

At Marylebone Police-court, Sussanna Barnes, milliner and dressmaker, Holles-street, appeared to answer four summonses under the Factory and Workshops Act for neglecting to take adequate measures to secure and maintain a reasonable temperature in the workshop where her assistants were employed.

Mr. Walter Stewart defended.

Miss Lucy Deane, an Inspector under the Act, explained that the workroom was a large apartment on the second floor, in which there were two fireplaces, one of which was sealed up. The only means employed for heating the room was an asbestos stove. Twelve young women were employed there, and on each of the three occasions that she visited the premises the room was noticeably chilly, and the young women appeared to be cold and uncomfortable. The temperature was, on the respective days, 50 deg., 55 deg., and 51 deg. Fah., whereas it should have been between 60 deg. and 65 deg. Fah. After her third visit all the young women were put into one part of the room nearer the stove, but that merely overcrowded that part and did not remedy the evil. The object of the Act, she added, was to prevent young women who came long journeys through the rain or snow having to sit in their damp clothes in a cold room.

Dr. T. M. Legg, Medical Inspector of Factories to the Home-office, and Dr. Wynter Blythe, Medical Officer of Health for Marylebone, expressed the opinion that a "reasonable temperature" in a workroom where the occupation was a sedentary one, was 60 deg.

Mr. Stewart submitted, in defence, that there had been no contravention of the Act. None of the young women, he said, had suffered any ill-effect from the temperature at which the room was kept. All of them had, in fact, been able to do some of the finest needlework possible, which could not have been done had their fingers been cold. He contended that this was a fussy prosecution. Several of the young women were then called. Most of them gave a qualified opinion as to the comfortable state of the room, but two of them frankly admitted that where they had had to work it was cold.

Mr. Curtis Bennett said the case for the prosecution had been proved by the defence. There was no doubt the temperature was too cold; 60 deg. was by no means excessive. The defendant, having to move about to wait on customers, might keep warm enough herself, but the poor girls sitting at their work hour after hour might be shivering with the cold. In his opinion the defendant was an obstinate person who defied the Act, and rather than unblock a fireplace and put a fire there, she compelled the girls to go into one part of the room, and even there the temperature was not warm enough for those farthest from the fire. He should not fine her this time, but under the first summons he should order her to put her workroom into conformity with the Act within six months, and pay £3 5s. costs. The other summons would be adjourned *sine die*, and if the order was not carried out a penalty of £1 a day would be imposed.

NOTES AND QUERIES.

Subscribers may obtain advice on matters appertaining to Public Health Law and Municipal and Sanitary Engineering. Letters should be addressed "Notes and Queries," The Sanitary Record, 5, Fetter-lane, London, E.C. If an answer be required immediately, a stamped addressed envelope must be enclosed

2148.—Lock-up Shop: Whether a Dwelling-house.—"Surveyor" writes: — Finding your 'Notes and Queries' column very useful and instructive, I should be greatly obliged if you could advise me on the following, viz.:—In my district, which is an urban one, the occupier of a lock-up shop is sleeping in the same, and as he has no other place or lodgings I presume he is using it as a dwelling-house. Town water is laid on to the shop. Would you please advise me what powers my Council have in a case like this?"

Answer.—The building in question is a dwelling-house, and the Council have all the powers in relation thereto which they have in regard to ordinary dwelling-houses, such as enforcing the requirements for w.c., e.c., or privy and ashpit, drainage, water supply, ventilation, &c. It is also a "dwelling-house" within the provisions of the Building Bye-laws. If there should be any matters in relation to the sanitary condition of the house as to which the querist is in doubt we shall be pleased to further advise him if required.

2149.—Payment by Commission to Officers Illegal.—"Surveyor" writes:—"Under the terms of my appointment as Surveyor, the preparation of plans does not form part of my duties, and previous to my appointment the work was entrusted to an outside engineer, but since I have been Surveyor I have prepared plans for various public works, and am now asking my Council for payment. According to the note, Section 193, on Lumley's Public Health Acts, it appears that gratuities for extra services may be disallowed by the auditor, and also that payment by commission is illegal. It would thus seem that the only legal way to remunerate me would be to raise my salary for the current year by an amount equal to the amount of commission

due. Is this so? I notice, however, that two or three Urban District Councils have only recently paid their surveyors by commission for the preparation of plans. (2) Please also state whether an officer, if appointed full time, can be prevented from devoting his spare hours (evenings, holidays, and perhaps Sundays) to private work."

Answer.—(1) The Local Authority may make extra payment for extra work carried out by their officers provided the work is clearly extra, but such payment should not be made by way of commission. The amount to be paid may, however, be equal to a sum which would be earned by payment by commission. The Authority may in the alternative increase the officer's salary on account of the extra work cast upon him, and to which increase he is clearly entitled. (2) When an officer is appointed to devote the whole of his time to the duties of his office, it is implied that he is not to engage in private practice. A Local Authority cannot, however, control the manner in which an officer is to devote his leisure hours, so long as he does not engage in work inconsistent with the terms of his appointment. Thus, it would be improper for a surveyor to prepare plans for new streets and buildings to be submitted to his own Authority.

2150.—Factory and Workshop Inspector's Qualifications.—"W. E." writes:—"Could you please inform me what is the routine to be followed in qualifying for a Factory and Workshop Inspector?"

Answer.—Candidates for appointments as Factory Inspectors are nominated by the Home Secretary, but must also undergo a competitive examination, held by the Civil Service Commissioners. The subjects of the examination will be found fully detailed in our reply to Query 1485, in our issue of May 26th, 1899.

2151.—Cements: Where Obtainable.—"D. J." writes:—"Will you be good enough to inform me where I can obtain a few samples of the following kinds of cement, viz.: Portland, Keen's, Martin's, Parian, and Roman cement?"

Answer.—The querist will be able to obtain such samples from any reputable local builder, plasterer, or ironmonger. Although the whole of these kinds may not be kept in stock by any local builder, &c., he could doubtless obtain some for him.

2152.—Erecting Building over Sewer in Urban District.—"M. O. H." writes:—"In this urban district a plan has been submitted to the Council for the erection of a coal store over a public sewer, which is a 2ft. stone culvert about 2ft. below ground level. The owners are willing to cover in the sewer with concrete. I am disposed to sanction the arrangement, but wish to know (1) Whether, under Sec. 26 of the Public Health Act, 1875, the owners can be prevented from building a store over a sewer? (2) Whether the Council can demand a guarantee that the store shall not at any future time be closed, but that it shall remain as now proposed with open sides?"

Answer.—(1) The Urban Authority have absolute power of refusal to allow the construction of the coal store, which is a building over the sewer, and if the owners proceed to erect the building without the written consent of the Authority, they will be liable to the penalties prescribed by Sec. 26. (2) The Council may give their consent, subject to the conditions suggested, but the Council should take a bond for the due performance of the agreement.

2153.—Sanitary Conveniences in Factories and Common Lodging-houses.—"S. D." writes:—"Is there any bye-law, memorandum, or regulation, issued by the Local Government Board requiring the provision of a sufficient number of water-closets in factories and common lodging-houses?"

Answer.—As regards the provision of sanitary conveniences in factories, Local Authorities are enabled, on the report of their surveyor, to require the construction of a sufficient number of water-closets, &c., for each sex in any factory or building in which persons of both sexes are employed. Where the Public Health Acts Amendment Act, 1890, is in force, Sec. 22 of that Act prescribes that:—"Every building used as a workshop, or manufactory, or where persons are employed in any trade or business, &c., shall be provided . . . with sufficient and suitable accommodation in the way of sanitary conveniences, having regard to the number of persons employed, or in attendance at such building, &c." Similar powers are also given under Sec. 35 of the Factory and Workshop Act, 1895. As regards common lodging-houses, where such houses are registered, the Local Authority may enforce the provision of such a number of closets as in their opinion is reasonably necessary. The bye-laws as to common lodging-houses contain clauses prescribing that sanitary conveniences shall be kept in a cleanly and wholesome condition.

2154.—Separate Cesspools for New Houses may be Enforced.—"Surveyor" writes:—"(1) In a district where no sewers are available, can a Rural District Council reasonably require a cesspool for the drainage of each house, so that each occupier may be made responsible for the emptying of the same? (2) Would the Council be empowered to refuse approval of plans where four drains are shown to discharge into one cesspool, on the ground that the proposed method of drainage is unsatisfactory? I refer you to Sec. 25 of the Act of 1875."

Answer.—(1) It should be observed that Sec. 25 of the Act of 1875 applies to urban districts, and we are not informed whether the Rural Council have been invested with urban powers in relation thereto. Inasmuch, however, as the owner proposes to drain the houses, the Rural Authority are enabled to exercise their powers of approval or disapproval in the case named, and they may enforce the provision of a separate cesspool for each house, the words of Sec. 25 and also Sec. 23 being that the drains shall empty into such covered cesspool as the Authority direct. (2) Yes.

2155.—Combined Drainage: Whether Drain or Sewer.—"S. P." writes:—"I shall be glad if you will inform me whether a combined drain which receives the drainage of three houses belonging to two different owners is a sewer or a drain. The P.H.A.A, 1890, is in force."

Answer.—It is probable that the length of drain from A to the party fence between the two houses belonging to one owner is a sewer. That portion of drain within the premises of No. 21 is undoubtedly a drain. We advise the Local Authority to serve the owner with notices under Sec. 23 of the Act of 1875 to provide a sufficient drain or drain for the two houses, *i.e.*, from A to B, and let the owner establish proof that any part of it is a sewer.

2156.—Public Analyst: Qualifications for.—"A. S. I." writes:—"Under the recent Order issued by the Local Government Board concerning the qualifications required by public analysts under the Food and Drugs Acts, would a D.P.H. be sufficient, providing he had sufficient knowledge of chemistry?"

Answer.—In our opinion, the possession of the Diploma of Public Health, without other certificates or diplomas, will not satisfy the requirements of the Local Government Board that the person is competent to act as public analyst. The Order of the Local Government Board, dated March 7th, 1900, making regulations as to the competency of public analysts appointed under the Sale of Food and Drugs Acts, 1875 and 1899, provides that—"Every person appointed on or after Jan. 1st, 1900, shall furnish such proof as we may deem sufficient of his competent skill in and knowledge of (*a*) analytical chemistry; (*b*) therapeutics; and (*c*) microscopy. Such proof shall in every case comprise documentary evidence that such person holds the requisite certificate, diploma, service, or document, conferring the qualification, or attesting his possession of the skill or knowledge to which the same applies, and granted or issued by any person or body of persons for the time being recognised by us as competent to confer such qualification or to test such skill or knowledge. Such proof shall also comprise such further evidence as we may in any particular case require."

2157.—Laying Out New Street: Meaning of Term Width at Entrance.—"Retrogressive" writes:—"I submitted the enclosed block plan of a field which I propose to lay out for building to an Urban District Council. The plan has, however, been rejected on the grounds that it contravenes the following bye-law, viz., 'Every person who shall construct a new street shall provide at one end at least of such street an entrance of a width equal to the width of such street, and open from the ground upwards.' The street to be laid out by me is of the full width, but the street leading to it is only 17ft. 6in. wide, does not belong to me, and I have no power to widen it. Kindly advise if the Urban District Council have power to reject my plan on these grounds. If they have this power, who is to make street, which does not belong to me, to comply with the bye-laws?"

Answer.—The Council are enabled to refuse approval of the plans on the grounds that the entrance to the new street is not of the width required by the bye-laws, notwithstanding that the road opening into the proposed new street may be a public highway of less width than that required by the bye-laws. See Barton Regis Rural District Council *v.* Stevens and others (1897), 61 J.P., 598, where it was held that the person who proposes to construct a new street shall, before he can be allowed to make it, provide an entrance to it of equal width with the street. We feel bound, however, to point out that the bye-law is one which is rarely insisted on, and recognising the hardship which it is likely to entail in some districts, the Local Government Board now approve a clause as an addition to that quoted by the querist as follows, viz., "Provided that where such street shall communicate with some other street, it shall suffice if he shall so construct such new street that at the point of communication it shall be open from the ground upwards to the full width thereof." In order to overcome the difficulty in the case cited by the querist, we may point out that he may proceed with the erection of one or more dwelling-houses after submitting plans to the Local Authority. The approval of not more than three buildings at a time should be sought, and inasmuch as the

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OFFICIAL APPOINTMENTS

BOROUGH OF KENSINGTON.—APPOINTMENT OF SANITARY INSPECTORS.

The Council of the Borough aforesaid are prepared to receive APPLICATIONS for the APPOINTMENT of FOUR SANITARY INSPECTORS.

Persons applying must be between 25 and 35 years of age, and must be on the Register of the Sanitary Inspectors' Examination Board, which includes persons who obtained Certificates of the Sanitary Institute prior to the 31st December, 1899.

The persons appointed will be required to reside in their respective districts, to wear a plain uniform, and to devote the whole of their time to the duties of the appointment. Salary £150 per annum, rising by conditional annual increments of £10 to £200.

The appointments will be made subject to the approval of the Local Government Board, and in accordance with the Sanitary Officers (London) Order, 1891, and preference will be given to candidates having had practical experience in some branch of the building trade.

Applications must be made in the candidate's own handwriting on printed forms to be obtained of the undersigned at the Town Hall, Kensington, and must be delivered at my office not later than Twelve o'clock noon on Saturday, the 27th April, 1901, accompanied by copies of not more than three testimonials of recent date.

The appointments will be made by the Council on the 15th May, 1901.

Personal canvassing of any Member of the Council will be a disqualification.

WM. CHAMBERS LEETE,
Town Clerk.

Town Hall, Kensington, W.,
10th April, 1901.

BOROUGH OF KENSINGTON.—APPOINTMENT OF LADY SANITARY INSPECTOR.

The Council of the Borough aforesaid are prepared to receive APPLICATIONS for the APPOINTMENT of an additional LADY SANITARY INSPECTOR, for the better enforcement of the sanitary provisions of the Factory and Workshops Acts, and the Public Health (London) Act, 1891, in workshops, workplaces, and laundries in their Borough, where women are employed.

Candidates must be between 25 and 35 years of age, either single or widowed, and must be on the Register of the Sanitary Inspectors' Examination Board, which includes persons who obtained certificates of the Sanitary Institute prior to the 31st December, 1899. The person appointed will be required to devote the whole of her time to the duties of the office, and to reside in the borough. Salary £110 per annum, rising by conditional annual increments of £10 to £150.

The appointment will be made on the 15th May, 1901, and will be during the pleasure of the Council, and subject to the approval of the Local Government Board.

Forms of application, with list of duties, can be obtained of the undersigned at the Town Hall, Kensington, and must be filled up in the candidates' own handwriting, and returned to me not later than Twelve o'clock noon on Saturday, the 27th April, 1901, accompanied by copies of not more than three testimonials of recent date.

Personal canvassing of any member of the Council will be a disqualification.

WM. CHAMBERS LEETE,
Town Clerk.

Town Hall, Kensington, W.,
10th April, 1901.

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construction of such cannot be deemed to be the laying out of a new street, the Authority will not be able, assuming that the bye-laws with regard to the buildings are complied with, to prevent their erection.

2158.—Assistant Inspector of Nuisances Cannot Sign Statutory Notices.—"T. H." writes:—"Is it competent on the part of an Assistant Inspector of Nuisances to sign his own name to statutory notices requiring the abatement of nuisances, or should the notices be signed by the Chief Inspector?"

Answer.—No. Such notices must be signed either by the Clerk or Inspector of Nuisances. Notices signed by an Assistant Inspector of Nuisances would be invalid. See Section 266 of the Public Health Act, 1875.

2159.—Bacterial Sewage Installations: Places Where Adopted.—"D. O." writes:—"A deputation from the Sewage Committee of this town are about to visit towns where installations of bacterial treatment of sewage have been laid down. Would you kindly suggest a number of towns which it would be advisable for them to visit, more especially where open and closed septic tanks are in successful operation?"

Answer.—Installations for the treatment of sewage on the double contact or Sutton system, and with or without open or closed detritus or septic tanks, are in existence at Sutton (Surrey), Worcester Park, Leeds, Manchester, Oswestry, Alton, Harrow, Haywards Heath, Hampton, Maidstone, Aylesbury, St. Albans, Crossness, Barking, Blackburn, Carlisle, West Bromwich, Guildford, Croydon, Epsom, &c. A fuller list may, we think, possibly be obtained from Messrs. Dibdin and Thudichum, consulting and analytical chemists, 2, Edinburgh Mansions, Howick-place, Victoria-street, London, S.W. For particulars as to places where the septic tank system is adopted we advise the querist to communicate with Messrs. Cameron, Commin, and Martin, 7 and 8, Bedford-circus, Exeter.

2160.—Gipsies: Nuisance: Housing of the Working Classes Act, 1885.—"H. F." writes:—"In my district a gipsy with three vans has settled on a village green, and has been there for four years. The green belongs to two Lords of the Manor, and neither knows exactly his own portion. Will you please inform me—(1) Can the Local Authority insist on 300 cubic feet for each adult? (2) Having no privy or w.c. accommodation, can the Local Authority serve notice under Sec. 91 of the Act of 1875, to erect a properly constructed privy, so as to prevent the nuisance caused through want of proper privy accommodation? The Local Authority will not take any steps under Sec. 36 of the Act of 1875, as the vans will move off when the Local Authority erects a privy. (3) What other steps can be taken with a view of clearing them off the green?"

Answer.—(1) Sanitary Authorities have control over vans occupied by gipsies, &c., for human habitation under Sec. 9 of the Housing of the Working Classes Act, 1885. The Medical Officer of Health and Sanitary Inspector should inquire into the capacity of the said vans, and if, in their opinion, the vans are so overcrowded, or they are in such a state as to be a nuisance or injurious to health, the Local Authority may institute proceedings for a nuisance under Sec. 91 of the Act of 1875. (2) The Local Authority may enforce the provisions of the Acts in regard to water supply, drainage, and w.c. or privy accommodation, for we assume that none of these are already provided. Proceedings should be taken under Sec. 91 of the Act of 1875. (3) The enforcing of the provisions of the Elementary Education Acts is often of considerable service in securing a removal of these unsatisfactory neighbours. The Local Authority may also make bye-laws under Sec. 9 of the Housing of the Working Classes Act, 1885, for promoting cleanliness, &c., in tents, vans, sheds, &c., used for human habitation. In the case of "Attorney-General *v.* Stone and others, 60 J.P. 168," an injunction was granted against the owner of land for restraining him from allowing it to be occupied by gipsies in such numbers and in such a manner as to be a nuisance to the neighbourhood. The nuisance was said to be caused by the insanitary condition of the land—the absence of proper drainage, overcrowding, dirt, noise, and untidiness.

2161.—Trespass: Erecting Building on Wall of Neighbour's Property: Scope of these Columns.—"Ynys" writes: "A is the owner of a leasehold house and garden. The latter is bounded by a wall built on his ground as per lease. B built a house adjoining the premises belonging to A, and some time later B became anxious to build a back kitchen at the rear of his house, and incidentally meeting the father of A (who is a widow) asked his permission to build the back kitchen on the garden wall belonging to A. The father of A said that B might do so as far as he knew, and on the strength of this verbal promise B built the back kitchen. A did not see this done until she called some twelve months later, when she was surprised to find such building erected on her wall, but made no protest. A subsequently sold the house to C, who desires now to establish his claim to the garden wall on which the back kitchen was built—eleven years ago. The question is: Can C claim compensation for building this back kitchen partly on his premises after a lapse of eleven years since it was erected? If so, what steps should C take to recover compensation?"

Answer.—This question is one which does not fall within the scope of these columns, which are restricted to questions on municipal and sanitary engineering and Public Health law. The querist should consult a local solicitor.

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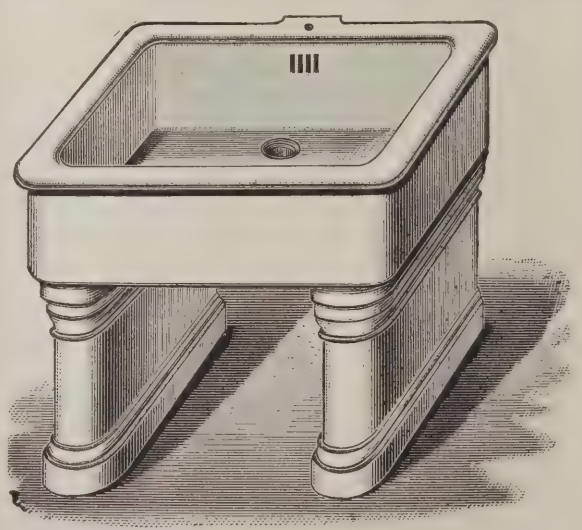

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SANITARY CERTIFICATES FOR SEASIDE RESORTS.

The system of issuing sanitary certificates to keepers of hotels, boarding-houses, &c., has been found so workable at Eastbourne that we make no apology for printing the subjoined list of requirements which might well serve as a guide to other health resorts we could mention. Such a system must of necessity increase the popularity of any resort where it is in vogue, offering as it does, guarantee to each visitor, of immunity from the risks of disease.

SANITARY CERTIFICATES—SPECIFICATION OF REQUIREMENTS.

(1) *Drains* to be of glazed stoneware or cast iron pipes with protective composition, having an internal diameter of not less than 4in.; to be laid in straight lines with regular and equal fall of not less than 1½in. in 10ft., and to be imbedded in concrete; to be provided with intercepting syphon, manhole and through ventilation, and to be outside the buildings if possible, if not, to be of iron and bedded in concrete. All joints to be proved sound by the "water test."

"*Drains*" applies to the whole drain from house to sewer. (If, however, the intercepting syphon is at the boundry of the premises and sufficiently far from the house, and if in such a case the drain beyond the intercepting syphon is found to be of good fall and working well, the part beyond the intercepting syphon need not be re-laid.)

"*Drains*" also applies to drains of stables or other drains in the same curtilage. Drains of stables or other buildings are to be effectively cut off from the dwelling-house drainage system. Inspection manholes, built with and rendered out with cement and sand, or of glazed brickwork and cement, to be provided at each change in direction of the drains and also at the intercepting syphon. The frame and cover to be of iron and the cover to be sealed down after final examination. The intercepting syphon to be as far from the dwelling-house as possible; the cap of the clearing eye to be securely fixed and air-tight in socket. Rain-water drains to be proved sound by water test unless proved to be in good working order and quite cut off from any other part of the drainage system.

(2) *Soil-pipes* to be outside; to have an internal diameter of not less than 3½in. (N.B.—Bye-laws for new houses, 4in.); to be carried up full size to just above the level of ridge of roof, and to have the fewest possible bends and angles; closet connections are to be drawn lead T-pieces. No seamed pipe permitted. Soil and ventilating pipes, if lead, to be at least 7 lb. to linear foot for 4in. pipe; if iron, to be at least 54 lb. to 6ft. length, with wide sockets; above the topmost closet connection the weight may be medium, the diameter remaining the same. In each case to end in a vertical position. Joints: whenever a stoneware trap or pipe is connected with a lead soil-pipe, between the two must be inserted a brass socket or other similar appliance; the stoneware end is to be inserted into the socket and the joint made with Portland cement; the socket is then to be connected with the lead pipe by means of a wiped joint where iron to lead sockets are to be used. Where a stoneware pipe or trap is connected with an iron soil-pipe or drain, the stoneware trap is to be inserted with a socket on the iron pipe and the joint made with Portland cement. Joints of iron pipes to be of caulked lead or other as satisfactory jointing material; red lead not sufficient. Stoneware traps inside a house will not be allowed unless of particularly satisfactory form. All solder joints to be "wiped plumbing" joints. In case of iron pipes, inside to be coated with protective material. The joints of soil and ventilating pipes to be proved sound by the smoke machine.

(3) *Ventilation of drains.*—Drain ventilation to consist of inlet and outlets, with outlets at the heads of the system to just above the level of ridge of roof; the soil-pipes to be additional to these outlets unless the former are at the heads of the drain system. Ventilation pipes to have a minimum internal diameter as in soil-pipes above.

(4) *Water-closets.*—Closet seats to be hung; lead safe, with outgo into open air having hinged flap at its end, to be laid over the whole of the floor space under the closet casing, unless the floor is of impervious material; walls under closet seats to be properly plastered. Traps and water-closets to be of approved self-cleansing form. The closet chamber to have proper means of ventilation; 2in. anti-syphonage pipes to be provided to each closet trap if the closets are in tiers. Such pipes to be carried out at once, and to terminate in soil-pipe at least 1ft. above the topmost closet connection.

(5) *Housemaids' slop sinks*, where they exist, to be constructed in every respect as water-closets.

(6) *Closet-flushing services.*—Cistern to be absolutely distinct from domestic service; 1¼in. pipe and valve to be fixed if the hydrostatic head be under 10ft.; 1in. pipe and valves may be used for heads of 10ft. and upwards. Flushing cisterns to be of three gallons capacity and syphonic.

(7) *Domestic water supply.*—A tap from the main to be over a sink and marked. Cistern, of proper size, to be provided complete with overflow and cover, in a suitable position, free from liability to fouling and effluvia.

(8) *Waste pipes* to be trapped immediately beneath the fittings, and to discharge over, or into gully traps in the open air. The waste pipes to be taken at once into the open air and with the traps to be not less than 1½in. diameter for baths, 1¼in. for washbasins, 1½in. for scullery, and 1½in. for pantry sinks.

(9) *Rain-water pipes* to discharge over or into gully traps unless carried to a rain-water tank, the overflow from which is to be into the open air in a suitable position.

(10) *Gully traps* to be of round way form; no such traps to be inside the house or any building connected with the house.

(11) *Dustbins* to be either brick-built rendered inside, provided with doors and coverings and floor to be above ground level, or galvanised iron receptacles with covers, to be in a suitable position.

(12) *Baths* when enclosed to have lead safe under the fittings.

(13) *Plan.*—A plan of the drainage system one-eighth scale to be deposited at the Sanitary Department.

CONDITIONS OF ISSUE.

The certificate to be void and to be returned to the Medical Officer of Health. (1) If any alteration be made in the drainage or sanitary arrangements without the approval of the Corporation. (2) If any defect be found in the drains or fittings subsequent to the issue of the certificate. (3) In any case not later than three years from the date of issue. The premises should be thoroughly re-examined at intervals of not more than three years, and the re-issue of the certificate will depend on the drains and fittings being again proved sound and in good working order. The issue of the certificate is to be an implied acceptance of these conditions.

As regards certificates which have been issued more than three years, a notice is sent to the owner or occupier of the house in question, offering re-examination and re-testing of the house, though this in the absence of any nuisance is, of course, not binding on the owner or occupier. The certificate bears on its face an abstract of the requirements, so that there is no doubt as to what the Authority certifies. The certificate is continually in

demand, and it is found that the house which has a certificate is more valuable than one which has not. This is no doubt partly due to the fact that the Committee makes no exception from the printed requirements, so that they can be depended on. Theoretical objections to their issue have from time to time been suggested, but the practical experience now is that they are of very great value and are issued with practically no friction.

INCORPORATED SOCIETY OF MEDICAL OFFICERS OF HEALTH.

PRESIDENTIAL ADDRESS.

An ordinary meeting of the Incoporated Society of Medical Officers of Health was held on Friday at the rooms of the Royal Statistical Society, 9, Adelphi-terrace, W.C. The President, Dr. J. C. McVail, occupied the chair.

Dr. A. Wynter Blyth, Medical Officer of Health, Marylebone, was nominated and elected President-elect for the year 1901-2.

Dr. Groves reported that the Medical Officers' of Health and Sanitary Inspectors' Tenure of Office and Superannuation Bill was down for second reading in the House of Commons on the 22nd inst., and he briefly explained its provisions, which he said were in the nature of a compromise. He appealed earnestly to all the members to use any influence they might possess with members of Parliament to obtain support for the measure, which was of the greatest importance to the public health service.

The President then delivered his postponed presidential address, his subject being "The Ethics of Preventive Medicine." He said that the question "Is life worth living?" might be an occasional subject for disputation, but for the sanitarian that life is worth living must ever be the principle of all his work. Its denial could hardly be regarded as serious on the part of sane men, and belonged to a period of cynicism rather than to the domain of real and settled belief. The old saying that whatever is worth doing at all is worth doing well, applied to the living of one's life at least as much as to lesser things, and applies to it in all its aspects, physical, moral, and intellectual. These two axioms might be regarded as the twin basis on which had been erected the whole science and practice of public health and preventive medicine. How closely the moral and intellectual aspects of life are related to the physical need not be dilated upon, yet at the very beginning of any consideration of the ethics of preventive medicine and the scope of its operations there arose the question as to its moral influence. While none could doubt the mental and moral value of

BETTER SANITARY CONDITIONS,

it was open to argument that sanitary administration —the means by which better sanitary conditions are attained—may have in one direction a very demoralising effect. If too much be done for the individual by his governing body, whether central or local, might not his sense of personal responsibility be weakened, might he not be led into a position of unwillingness to act for himself, and to rely on Government to carry out duties which properly belong to him?

This question was part of the very wide and difficult subject of the proper limits of municipal socialism; where should the boundary be drawn between what a man ought to do for himself, on the one hand, and what the State or the municipality ought to do for him on the other? On some points, such as water supply, scavenging, lighting, and so on, the nation is now agreed. As civilisation advances, the mechanism of government, whether national or local, becomes more elaborate, and its functions more intricate and inclusive, so that the sphere of private responsibility is bound to become in these directions correspondingly narrowed. Long ago the State undertook the duty of looking after the poor and the education of the children; the provision of school books is now undertaken by some Boards, and a still further step was made in the provision of a mid-day meal, on the ground that, in the case of poor and ill-fed children, this is a natural corollary of compulsory education. Even tennis grounds, cricket pitches, and bowling greens had been provided in our public parks and recreation grounds, so that a cynic might say a return is being made to the old conditions under which Roman Emperors attempted to placate and cajole the population by gifts of bread and games. But the difference was obvious. The games in the Coliseum were spectacles for the entertainment of the onlookers, while the games of the municipalities are healthy exercises in which all may join. In many places the means of locomotion were in the hands of the Local Authorities, but he had not yet heard of a free service being provided, though in Glasgow this was being foreshadowed by a

DEMAND FOR FREE FERRIES.

If there are free bridges in one part, why not a free substitute for them in another? Such a service would be a very considerable development of municipal socialism. If a man may freely walk across a bridge, or be carried across in a ferry at the cost of the town, why should he not also be carried along the street? Why should not the tramway service be free? It was, he supposed, too early to talk of those travelling cavements described by the novelist of science, Mr. Wells. However, such means of locomotion as ferries and tramways had little to do directly with public health, but they might easily develop still further, so that the workers in the town might have the opportunity of a free suburban train or bus service, so that they could live their leisure in the fresh air. Closely connected with this was the question of house accommodation, and there was evidence that this subject was likely to be taken up at no distant date as a matter of Imperial concern. In endeavouring to mark the boundaries which should be set to such enterprises as these, various principles could be suggested. It is one of the

ESSENTIALS OF A BYE-LAW

made under an Act of Parliament that it shall be of general application; on the same lines it is said that national and municipal schemes in the direction of socialism should be such as must benefit whole communities and not mere individuals. Much depended as to whether direct or indirect benefit is meant. If direct benefit be meant, then not even the Poor Law nor the Education Acts could be justified, for only a small minority receive poor relief, and many persons have no children attending elementary schools. If indirect benefit is held to be sufficient then the scope of operations might be widened to almost any extent, as very little is done by either Parliament or Local Authorities in defence of which there could not be alleged an ostensible reason of some indirect benefit to all. Another principle that might be suggested is that such enterprises should by improving environment give every man a fair chance in life, but should leave the individual himself to take such advantages as he may of the opportunities given. Where, however, was the line to be drawn between environment and environed? Climate is environment, and in so far as it could be influenced they were on safe ground. In "Looking Backward" was sketched

A TYPICAL EXAMPLE OF FUTURE SOCIALISM,

a municipal umbrella to be thrown across whole streets in time of rain; but certainly the removal of smoke and dirt from the atmosphere of cities is a matter of

first importance, which was well within the range of practical effort. Next to climate the city itself is an inner layer of environment, and its conditions should be improved in every possible respect. Next came the dwellings; on these much had been said, much had already been done, and much more might be looked for. Clothing was the next, but no one had yet proposed that the State or the municipality should clothe its constituents, though many towns had provided laundries at which clothes might be washed; but that was not all, for the human body itself might be regarded as the inmost covering of the individual. For this layer of environment there are public baths for cleansing and exercise, in order to maintain its health and vigour. Then there was the soul, and surely here we have got away from environment; but no, religious ordinances are provided for the benefit of the soul. In face of all this, it would probably be admitted that attempts to measure the

TRUE FUNCTION OF PUBLIC BODIES

solely by the test of the improvement of environment are likely to be attended with considerable confusion, and to leave it open to every man to claim that his own particular scheme fulfils requirements. The reason why it had not been proposed that clothing should be a municipal duty was obvious — clothing was a thing which the individual could do best for himself. Here was a principle which should often be of use in deciding where to draw the line between corporate and individual action. His two first axioms were, first, life is worth living, and secondly, that life is worth living well. When a municipality undertook a duty which could be done best for himself by the private citizen, it was proceeding on lines at variance with the second axiom. Allied to this aspect of the question was the other point, whether modern sanitary administration must incidentally have a bad effect by weakening the sense of personal responsibility by

MINISTERING TO SELFISHNESS

and by diminishing self-reliance. His experience had shown that some people were only too ready to throw off their personal responsibility and even to demand remuneration for work which they ought to have been glad to have had the opportunity of doing on their own behalf. His four suggestions for making the boundary between individualism and socialism had been touched on, viz.: (1) That collectivist measures shall be of general application. (2) That they shall so improve the environment as to give every man a fair chance in life, but shall leave the individual untouched. (3) That they shall do nothing for the individual when he can do better for himself. (4) That they shall interfere as little as possible with the sense of personal duty and responsibility, and shall be careful not to encourage selfishness or pander to laziness. No doubt there were other suggestions, but it was obvious that none could be applied rigidly, and that the circumstances affecting the numberless social problems which offer themselves for solution are so various that each must be judged on its own merits, just as in the diagnosing of obscure disease every indication is to be carefully marked and weighed and the conclusion arrived at by attention to all the facts of the case. There must also be kept in view the fact that

NEW PROBLEMS

are not to be faced in a too timid or uncertain spirit, but that recognition must be given to the general tendency of the times to make the functions of the State and the municipality, more and more extensive and inclusive. The preservation and improvement of public health has long been regarded as well within even the narrowest boundaries, which could be drawn round the sphere of operations both of Central and Local Authorities, yet when consideration is given to the various classes of measures which can be taken to carry out this important purpose, we still find ourselves in the region of controversy, and there is little that sanitarians can do which is not on grounds of principle, or of results, or of both made the subject of hostile criticism. Busy men who are fully persuaded of the value of their work life, and knowing only too well that art is long and life is short, and judgment difficult, could give little heed to these criticisms, and could spare little time in attempting to confute the critics. Preventive measures could be divided into three groups, or regarded as the three walls which constitute the defences of the city of Hygeia, so pleasantly written of by the late Sir B. W. Richardson. The outer wall was sanitarian in the sense of cleanliness of air and water, food and soil, and so on; the middle wall was preventive inoculation, and the third wall was hospital isolation.

Having dealt with each of these divisions of sanitation at considerable length, Dr. McVail advocated that in practical sanitary administration they should take short views rather than long views, doing that which was to hand and could be done without waiting for grander and larger schemes. Short views were not the same as narrow views. They were on unsafe ground when they attempted to advocate legislation to make compulsory measures which science had proved to be of value. In such matters their official attitude should be not that of legislators but that of educators of legislators. They knew that certain things were good for health and certain things were bad for it, but it did not necessarily belong to them to say that the doing of one set of things and the avoidance of the other should be insisted upon by Act of Parliament. Their proper place was to tell the country and Parliament the exact facts regarding every such question, and use all the earnestness they possessed in impressing upon the public mind the scientific conclusions deducible from the facts, but it was not for them to say the law must be altered to give effect to the principles brought under notice. It was their duty to drive in the facts and leave to the legislature the duty of making laws based on those facts.

PROGRESS IS BUILT ON PROGRESS,

rule on rule, advance on advance, so that present measures are stepping-stones to still better measures in the future. In addition to the direct benefit which accrues to the living generation from improved sanitation, and in addition to the good which inhabitants of this country fifty years hence will derive from persistent development and improvement of environment, it would certainly be a gratification if sanitarians and all who are endeavouring to help humanity could feel that they themselves have acquired as a result of better air, food, and exercise. There efforts are to be of direct service in the future through the parents whose health is being helped transmitting by heredity some of the bodily conditions which they themselves have acquired as a result of better air, food, and water, and exercise. There was, however, much scientific controversy as to whether acquired qualities were transmitted as was the case with constitutional conditions, but whatever doctrine ultimately prevailed it seemed to him that their duty was just the same. They were not charged with the

RESPONSIBILITY OF THE FUTURE

of the whole human race; to assume such a function would be to demonstrate their own colossal self-conceit. Duty was more important than speculation, and they must continue to take short views of their work. Indeed, if ever there was to be any hope of realising the visions of the night, or turning into solid facts the dreams which young men dream—and there was nothing like a deep-seated belief in the value of one's work to make a man continue to feel young, notwithstanding all evidences to the contrary—and if ever long views are

to lessen their distance from us, it must be through unceasing energy in giving effect to short views. So that if we continue carefully to distinguish between the creed and the programme, there need be no hesitation in admitting that long views may help to frame the creed, if short views alone can be of use in filling up the programme. As a well-beloved teacher used to say

"TO REALISE THE FUTURE, EMPLOY THE PRESENT."

Their programme must be the conserving of health and the protecting of life, and the preventing of death whenever and wherever the opportunity can be found. To withhold a helping hand in the hope that some distant good may result would be to act on the doctrine that the end justifies the means; indeed, it would be worse, for there is no certainty that such ends would ever be attained by such means, and there is no certainty that they may not be attained and achieved by methods that lie beyond the scope of our knowledge. Setting their attention to its natural limits, let them do their work within those limits, saving one life by inoculation, another by sanitation, and a third by isolation. On these lines, and on these alone, is progress safe and sure; they might not bring the notoriety that hysterical and irresponsible sensationalism would ensure, they might not create the interest which properly attaches to such business-like thought and great scientific achievement, but whether crowned or crownless when we fall it matters not, so that God's work is done.

The address was received with prolonged applause, and a hearty vote of thanks was accorded to Dr. McVail.

SUCCESSFUL SEWAGE DISPOSAL AT BASFORD.

By Dr. GEO. BURY BRAY, M.O.H Basford Rural District Council.

IN my last annual report I foreshadowed an account of experiments Mr. Maylan and I had been carrying out at the Kimberley farm, as a result of our visit to various sewage farms in the country, and our attendance at Sanitary Congresses. To lead up to this account I think a short history of the farm is necessary. In 1884, owing to threatened legal proceedings in consequence of sewage pollution of running streams, Kimberley was sewered to the present farm; the main outfall sewer was provided with two manholes on the way, from both of which, by means of valves, the sewage could, when required, be diverted on to grass land for broad irrigation treatment. On arrival at the farm, the sewage was received into a rectangular tank (divided into three compartments) in which it was *occasionally* treated with lime; from this tank the effluent found its nearest way over the stiff clay land into the brook. In 1896, after a fruitless appeal to the Local Government Board for a loan, you had the three tanks converted into "Cosham's Tanks" (six instead of three), with the addition of a straining chamber, and a baffle race (the latter for the treatment of the sewage with Spence's alumino-ferric precipitant) and the tank effluent was to be distributed over *the stiff clay land* for final treatment. In my report for 1896 I wrote of this treatment;—"The effluent from these (Cosham) tanks is a remarkably good one, but from the nature of the sewage and the land at your disposal, I would strongly recommend the further treatment of the effluent by filtration, as I am certain the land is useless for the purpose."

After my visit to the Sanitary Congress at Leeds, in 1897, you granted me permission to put down a coal filter for the partial treatment of the tank effluent, and the result was satisfactory. In 1898, when Mr. Maylan became associated with me in the treatment of the Kimberley sewage, he entered into the subject with the greatest enthusiasm, and the present state of the farm is entirely due to his exertions. There are now four filters (or primary contact beds) for the first filtration of the day flow from the tanks, and one large one provided with stationary sprinklers for the second or final treatment. In addition there are two large primary contact beds for the first filtration of the night flow from the tanks, each provided with a large secondary filter. These latter are not at present provided with sprinklers, but we propose to add them later on. We also propose to make primary and secondary beds for the treatment of storm water, and also prepare a portion of the land on the south side of the brook, to take part of the sewage when necessary. It will, however, be necessary to have several more filters, in order not to overwork the existing ones, and also to be able to give any and each of them a rest periodically.

Our experiment began in December, 1899, when we gave up the use of chemicals and removed the screens, thus receiving chemically untreated, unscreened crude sewage in the Cosham tanks. After a short time, as no scum formed on the surface of the tanks, we duplicated the Cosham flocculent flues, and in three days' time a scum began to form on the first two tanks, and eventually it spread to all six; this scum remained and increased in thickness, the increase being most marked and most rapid on the first two, and gradually thinned off, till it was only three inches thick on the sixth tank, at which thickness it has remained now for some months. It was quite a month before solvent action took place, and nitrites appeared in the double-filtered effluent, but once they did appear they remained till the close of the experiment in November, 1900. At that date, owing to the filling up of the *first two tanks*, and the primary contact beds showing signs of clogging, it was decided to clean out those tanks and give the contact beds a rest. On cleaning out the two tanks it was found they were practically filled with a gelatinous homogeneous material of strong odour, and dark blackish colour, evidently the solid organic matter of the sewage undergoing putrefactive resolution changes. It has now been decided to use the first tank as a screen, from which the floating solid matter is removed daily, the other five tanks retaining their action as open septic tanks. During the time of the experiment daily thermometric readings were taken of the tank effluent, filtered effluent, and outside air, and from them we conclude we have nothing to fear from frost, as in the exceptionally severe weather of February, 1900, when the outside thermometer registered 32 deg. of frost on the 13th of that month, our lowest effluent reading was 41 deg., a temperature which does not prevent microbic action.

From the year's working at Kimberley Farm under the severe test we put it to, we have come to the following conclusions:—(1) That screening of the trade refuse is necessary, either at the source or at the farm. (2) That no chemical treatment is necessary, in fact it is retrograde and expensive. (3) That the tank capacity should be equal to at least three times the actual dry-weather flow, or an estimated day's dry-weather flow, based on 20 gallons per head per day, and that only that amount should be allowed to flow through in storm time. (4) That the night flow and storm-water overflow should be specially provided for and treated by double filtration. (5) That the primary filter beds for sewage treatment should be much more in area than is usually necessary for the ordinary treatment of the flow, to allow change and rest. (6) That the secondary filter beds should have the partially-treated effluent so distributed over them that efficient aëration is ensured. (7) That the sludge difficulty is relieved but not removed; there will always be a certain amount of sludge formed, its quantity being in inverse proportion to the efficiency of the screening and capacity of the tank.

THE SCOTTISH INSANITARY ONE-POUND NOTE.

The Scottish one-pound bank note has often been under suspicion as a convenient vehicle for the dissemination of infectious disease. The following remarks which occur in the annual report of Mr. George Mackay, chief Sanitary Inspector for Perthshire, give further currency to this idea:—

To the English traveller the issue and circulation of £1 bank notes in Scotland, he observes, had often given rise to feelings of surprise, mingled with those of disgust, as in this connection, he (the traveller) was not accustomed in his own country to bank notes for a smaller value than £5, which were never allowed in circulation the second time after being returned to the banks. They had in Scotland a vast number of these £1 papers in circulation, and while the most of them would be very pleased to be in possession of a few thousands of them, he was afraid that under certain circumstances there lay hidden within their crevices the dangerous microbe of scarlet fever, small-pox, or other forms of infection. This was not to be wondered at when they thought of the number of hands through which these notes have to pass; and it could be conjectured how easy it was to convey these disease microbes from either a recovered case of scarlet fever or small-pox to the innocent and unsuspecting person who handles the note shortly after. It was a customary practice among the general public to moisten the finger on their lips to facilitate counting, and thus convey whatever may be inimical to a sound body to the note, which may become a ready element in the conveyance of disease; but apart from the danger which may be apprehended from infectious disease, it must be confessed that when a bunch of these filthy notes is in the hands while in the operation of counting, it is a common occurrence to perceive a heavy and disagreeable odour.

The sanitary officer is very frequently puzzled in accounting for the real cause which has given rise to a specific and isolated case of infectious disease. Is it not reasonable to suppose that this mystery may be due, in certain cases, to the agency of bank notes? In his own experience a case some years ago came under his notice where a bank note was blamed as being the direct means of conveying infectious disease. In this case a young girl was recovering from scarlet fever, and took the first opportunity to communicate with her parents in the country, and while another inmate of the house was writing the letter the girl was absent-mindedly fingering a paper note which was enclosed in that letter. A few days after receipt of the note her sister took scarlet fever, which was not at that time anywhere in or near the locality. He had no doubt that similar instances could be cited by others. It appears that there is no proper or uniform system among the Scotch banks whereby these filthy notes can be recalled or taken out of circulation.

The present system seems to be to leave this to the discretion of the teller or some other bank official to retain such notes as he considers to be too dirty. He was afraid, however, that this duty is rather tardily done, as the production of new notes entails a little expense to the banks concerned; but surely the enormous dividends earned by our Scotch banks can well afford to let the public have clean notes, at all events in the absence of gold. No doubt when new notes are first issued they have something like an impervious gloss or sheen, which somewhat helps to prevent the ready lodgment of infected microbes. It was therefore obvious that the more frequently bank notes are called up the less danger there is to the public. Would it not be advisable that banks should call up at stated periods all notes, and retain such of them as they consider suitable for re-circulation, but seize and destroy all crumpled, soiled, or dirty ones, or those that are likely very shortly to become so? Any member of the public, however, has the right of demanding and obtaining payment in either gold or silver, which possibly may not be absolutely safe, yet certainly is safer than the filthy notes referred to.

National Health Society.

OFFICIAL TRANSACTIONS.

The annual general meeting of the Society will be held at 53, Berners-street, on Wednesday, April 24th, at 5.15 p.m. All members of the Society are invited to attend this meeting, when the report for 1900 will be read.

Suffolk.—Forty-eight lectures were given by one of the Society's lady lecturers in this county during 1900. The subjects chosen were Health and Nursing, and the attendances, composed of women only, have been excellent. "Every available woman in the village" is often the report of the local secretary. The lecturer (Miss Morgan) is of opinion that lectures on these subjects should be limited to women, and that such nursing and health as is necessary for men should come under the heading of First Aid. Unfortunately in Suffolk the County Council does not see its way to granting fees for examinations, so that there are no classes or examinations in this county.

ASSOCIATION OF NATIONAL HEALTH WORKERS.

The Committee of the above are now making arrangements for their annual course of lectures, which will take place during the week commencing May 6th. Miss Alice Busk has kindly promised to lecture on "Women as Sanitary Inspectors," on Tuesday, May 7th, while on Thursday, May 9th, Dr. Squire will lecture on the "Open Air Treatment of Consumption." On Friday, May 10th, a lecture on "Vaccination" will be delivered by Edward J. Steegmann, M.B., D.P.H. Other arrangements will be announced later.

Sheriff-Principal Rutherford recently, in Edinburgh Sheriff Court, heard parties' claims for exemption from the proposed scheme of Midlothian County Council to extend Liberton drainage district and to unite it with the Gilmerton special drainage district. The Sheriff remitted to Mr. B. Hall Blyth, C.E., a report as to whether the estimate prepared by Messrs. Belfrage and Carfae, C.E., was correct, and whether the sum of £1000 allowed in it for compensation for surface and other damage was sufficient; whether there were any natural features in the district which were obstacles, and whether the extension of the Liberton district and its union with the Gilmerton special drainage district was expedient. Mr. Hall Blyth has reported favourably of the engineers' report, but states that in addition to the ground which is included in the scheme there should be added other grounds, which include the reservoir and filter beds of the Edinburgh and District Water Trust at Alnwickhill, as well as other portions belonging to Major Gordon Gilmour, Mr. John Welsh, Moredun, and others. At a sitting of the Court last week, agents for the appellants intimated that they acquiesced in Mr. Blyth's report, and withdrew further opposition to the Local Authority's resolution. Counsel for the Edinburgh and District Water Trust, however, objected to the report, and craved delay to enable them to lodge answers. The Sheriff made avizandum.

CORRESPONDENCE.

(*To the Editor of* THE SANITARY RECORD.)

(*We do not in any way hold ourselves responsible for opinions expressed by our correspondents.*)

TAR PAVING FOR FOOTPATHS.

SIR,—I send the following particulars of a tar path I laid last year, in the hope they may be of some service to "Assistant" (Query 2123). The path, containing 440 yards superficial, was laid along an avenue where it was considered unnecessary to have kerbing. The original gravel path was 7ft. wide, and the new path is 5ft., leaving 1ft. on each side. The path was excavated to a depth of 2in. in the middle and an extra 2in. at the edges to make them solid. No concrete was used underneath as the ground was sufficiently solid. A layer of tarred gravel 1½in. thick was laid first, and on this was the top coating of slag, chips, and tar. The following quantity of material was used:—

	£	s.	d.
Slag, 14 tons 12 cwt., at 6s.	4	7	7
20 loads of gravel at 2s. 6d.	2	10	0
20 barrels of tar at 6s.	6	0	0
6 loads of sand at 2s. 6d.		15	0
3 tons of coal at £1 5s.	3	15	0
Labourer, 63 days, at 3s.	9	9	0
Carting	1	0	0
Total	£27	16	9

The stuff was mixed in June and laid in September, and has not been affected by the frost. One part of the path was faced with deal sawdust as an experiment. This is more silent than the sand faced, but the dripping of the trees was unfavourable to the experiment. The creeping will take place if the material is laid too soon after it is mixed.

Yours faithfully,

Godmanchester. C. MAYFIELD.

PERSONAL.

MR. GEORGE GROCOTT has been appointed Town Clerk of Hackney.

MR. S. CLEGG, of Darwen, has been appointed Electricity Engineer for Lincoln.

MR. C. PETTIT, of Ipswich, has been appointed Engineer at the Derby Workhouse.

MR. R. W. MARSHALL has been appointed Inspector of Nuisances for the urban district of Uttoxeter.

MISS DRAPER has been appointed Resident Medical Officer of the new Isolation Hospital at Walthamstow.

DR. WHITTINGTON has been unanimously reappointed Medical Officer of Health for Neath for the next three years.

DR. JAMES LAURIE, Greenock, has been appointed Medical Officer of Greenock Prison, in room of Dr. J. R. Black, deceased.

THE salary of Dr. Dudfield, as Medical Officer of Health for Paddington, has been increased from £600 to £800 per annum.

MR. W. R. DAVIDGE has been appointed Assistant Surveyor under the Teddington Urban District Council, at a salary of £100 per annum.

MR. R. G. MARSH, Assistant Sanitary Inspector at Leeds, has been appointed to the important position of Sanitary Inspector at Cape Town, South Africa.

AT the last meeting of the Richmond (Surrey) Town Council, the salary of the Water Engineer was raised from £320 to £350 per annum. This officer has been in Richmond's service for over twenty-five years.

MR. J. RODERICK has been reappointed Inspector of Nuisances for Llandovery.

DR. MILLARD has been appointed Public Analyst for Burton, at a salary of £50 per annum.

DR. F. T. BOND has been reappointed Medical Officer of Health for the rural district of Chipping Sodbury.

THE salary of Dr. J. Howard Jones as Medical Officer of Health for Newport, has been increased to £500 per annum.

ON the recommendation of the Health Committee, the salary of the Inspector of Nuisances for Richmond (Surrey) has been advanced from £175 to £200 a year.

THE Local Government Board has sanctioned the reappointment of Dr. W. J. Smith as Medical Officer of Health for Lepton, and Mr. Ed. Sykes as Inspector of Nuisances.

THE salary of Mr. Nesfield, Inspector of Nuisances, Surbiton, has been increased from £150 to £200 per annum. He is also to advance £10 per year for the next five years.

MR. WILLIAM FRANCIS DEWEY has been appointed Town Clerk of Islington, at a salary of £1150 per year, together with his fees as Returning Officer and Deputy Returning Officer at elections.

MR. JNO. JONES, who holds the certificate of the Sanitary Inspectors' Examination Board, and who was lately Assistant Inspector at Bethnal Green, has been appointed Sanitary Inspector to the Jewish Board of Guardians.

WE understand that Dr. F. J. Waldo is one of the six selected candidates for the Medical Officership of the City of London. Dr. Waldo's qualifications should stand him in good stead, and go a long way towards ensuring him a position which he is eminently fitted to fill.

WE are informed that Dr. E. Gwynn, the Medical Officer of Health for Hampstead, has sent in his resignation of the office, which he has held for over twenty years, stating that, having regard to the additional duties which would devolve on him, he is not prepared to continue in office under the terms proposed by the Borough Council, which were an increase of his salary from £350 to £700 a year, with a promise that he should not undertake private work.

MR. JOHN SIMPSON, who was recently appointed Health Inspector at Brisbane, served his apprenticeship to the plumbing trade at Aberdeen. He acquired a full knowledge of the work in a practical sense, and afterwards becoming impressed with the importance of sanitary science in connection with his business, and set himself to the task of gaining a knowledge of the subject with so much zeal and success that he obtained the diploma of the Sanitary Institute of Great Britain, and the diploma of the Sanitary Association of Scotland, the Sanitary Science Diplomas of the Guilds of London also fell to him. He afterwards acted as assistant on the teaching staff of Gordon's College, Aberdeen, and was ultimately for three years in full charge, teaching practical and theoretical sanitation.

THE able article on "The Housing of the Working Classes in Scotland" in last week's issue was by Dr. William Robertson—not Robinson, as printed. Dr. Robertson was, at the time it was written, Medical Officer of Health for Paisley; he is now Medical Officer of Health for Leith.

WANTED.—Mr. S. Protheroe, Sanitary Inspector, City of Hereford, would be greatly obliged to any of our readers who would supply him with, or inform him where he can obtain, a copy of the Public Health Acts Amendment Act, 1890, Sec. 23, dealing with (1) keeping water-closets supplied with sufficient water for flushing, and (2) the paving of yards and open spaces in connection with dwelling-houses.

MUNICIPAL ENGINEERING & SURVEYING.

CROSS-TABLE CHAT.

I FANCY that the extended experience of surveyors with the working of the Private Street Works Act, 1892, tends to a strong condemnation of it in practice, and inimical to progress, and that they would gladly revert to the system of making up private streets under Sec. 150 of the Act of 1875 were it possible to do so. Unfortunately, however, when the Act of 1892 is once adopted in any district it cannot be repealed.

ONE or two instances which have come under my notice recently evidence strongly the imperfections of the Act. In one of these a Local Authority resolved to make up a street 40ft. wide, which had been laid out by the landowner, who had included in it a public footpath 6ft. wide, which had been repaired by the inhabitants at large. The usual notices having been served upon the abutting owners to make up the street, objection was taken by them, as provided for by Clause (*b*) of Sec. 7 of the Act, to the proposals on the ground that "part of the street was a highway repairable by the inhabitants at large," and on the hearing before the magistrates the latter gave their decision that the Council had failed to prove that the road was a street as defined by Sec. 5 of the Act, and "not a highway repairable by the inhabitants at large," and the Council had to charge the cost of making up the street to the rates.

SUCH an interpretation of the law, paradoxical as it may seem, is not unsupported by the Act, for it is absolutely silent as to what is to be done where an owner sustains an objection that part of the street was formerly a highway. Under Sec. 150 of the Act of 1875, the owners would have been liable to pay in respect of the entire street, including the old highway (or public footpath). But under the Act of 1892 he may, if he places his case in the hands of a skilful lawyer, entirely evade his responsibilities, and also the cost of making up a street laid out by him where a narrow strip of it was formerly a public footpath.

IN another case where an owner, who had what is commonly known as a long "flank frontage" on a street, objected to the Authority apportioning him at the same rate as other owners on the ground of "degree of benefit," the magistrates—with that facility for deciding in favour of landowners which is so general—adjudged that he should pay on a greatly reduced apportionment, and the balance had to be charged to the rest of the owners or to the rates. Such methods of adjudication are vexatious and inequitable, and serve to illustrate the "glorious" uncertainty of the law and the objectionable provisions of the Act, whereby magistrates have transferred to them power to decide upon technical and other questions which, under the Act of 1875, were left to the Local Authority to decide.

FREE public baths are not yet known in this country, but there are many advanced sanitarians who advocate their establishment, and it is probable that such will eventually be established. In fact, there appears to be no limit to the addition of municipal burdens, nor to the increase of rates, and it is difficult to foresee where and how a "halt" can be called. In America, the city of Buffalo runs a free public bath all the year round, which is used by thousands of men, women, and children, and is highly popular. Each bather is provided with a piece of soap and a clean towel free of charge. During the month of January 10,957 men, women, and children availed themselves of the free bath privilege. The baths are inexpensively constructed, and in this respect English municipalities might possibly copy their example, for there is almost invariably a tendency to undue elaboration and ornament in English buildings of this class. As soon as it can be shown that the provision of free public baths is a good investment from a health point of view, I venture to predict that English municipalities will provide them.

I HAVE alluded before this in my notes to what has appeared to be a reasonable demand for a revision of the Model Series of Building Bye-laws for rural districts, and suggested the substitution of some hard and incombustible material other than brick or stone to cheapen the cost of construction of workmen's cottages. There does not, however, appear to have been any acceptable substitute put forward. In addition to the representations of a conference of Local Authorities, the Royal Institute of British Architects have been also pressing the Local Government Board to relax the bye-laws.

As a result the Board has drawn up a modified code of regulations, which are now obtainable. These regulations are not such as will commend themselves to Local Authorities, and they have been framed, it is evident, to meet the complaints of the Royal Institute of British Architects, and not for the especial purpose of cheapening the cost of erection of cottages. In fact, the Local Government Board have made a complete surrender to the private architect and absolutely ignored Local Authorities and their officials, whose experience and advice, if sought, would have been of incalculable good.

ONE has the greatest respect for the Royal Institute of British Architects, but it is impossible to ignore the fact that they are not so disinterested as to be able to advise as to how the public interests and public health should be safeguarded. Moreover, professional architects are not able to control the erection of possibly more than 20 per cent. of buildings erected in the country. The remainder are erected without his supervision, and the builder is responsible to no one save the Local Authority, whose function is to ensure that the bye-laws—framed for the purpose of securing stability, the prevention of fires, and for purposes of health—are observed. The architects complain that the enforcement of bye-laws "is an unnecessary and vexatious infringement of the liberty of the individual subject." This is a thread-bare catch phrase which has done duty for centuries in regard to all laws in civilised countries, and is dear to the heart of others than architects, viz., jerry builders. I hope to revert to this subject in a succeeding issue. SENEX.

OBITUARY.

DR. P. ALEXANDER, WHITLEY.

DR. P. ALEXANDER, of South End, North Parade, Whitley, died somewhat suddenly at his residence, on the 9th inst. He was sixty-two years of age, and has for many years been Medical Officer of Health of the Whitley and Monkseaton Urban District Council. In fact, the deceased gentleman was the oldest medical practitioner in the district. His death was somewhat unexpected, as until the previous Sunday he was in his usual health, and was out on that day.

LAST Thursday Mr. F. H. Tullock held an inquiry on behalf of the Local Government Board, at Teddington, with regard to an application of the Council to borrow £920 for camp-shedding the river frontage of the sewage disposal works, £666 for works of public street improvements, and £600 for works of private street improvements.

NOTICES.

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The Sanitary Record

AND

Journal of Sanitary and Municipal Engineering.

APRIL 18, 1901.

THE WEAR AND TEAR OF LIFE.

LAST Saturday the Registrar-General issued his report on the estimated population, and on the marriages, births, and deaths registered in England and Wales during the year 1899. To the outsider it may appear strange that fifteen months must elapse between the close of a year and the issue of such returns, but when we consider the immense labour involved in dissecting the reports sent in by the sub-registrars, it will soon be realised that the time occupied is by no means excessive. Each year, too, the report increases in bulk, and invariably the Registrar-General emphasises some feature which takes hold of the popular fancy. This is often enlarged upon by the leading journals of the day, sometimes to the exclusion of the more important lessons set forth by the returns. This year the popular feature is the fact that the marriage-rate is the highest in any year of the last quarter of the nineteenth century. It is exactly the same as was reported in 1876, viz., 16·5, and is 1·1 above the mean rate of the term of years 1889-98. A high marriage-rate is a healthy sign for any nation. It indicates the prosperity of the staple industries, for when trade is bad there is always less inclination to embark upon the responsibilities of marital relationships. It will be surprising, however, if this upward tendency was maintained in 1900. The great drain which the country sustained during that year of young men drafted to South Africa must have told against it, and when the next report is issued we fully expect to see a considerable reduction in the percentage of marriages.

But the portion of the report to which the student of health statistics naturally turns is that which gives the death-rate for the year, and here he is doomed to disappointment. True, a rate of 18·3 is an improvement on 22·7, that recorded in 1875, the year of the passing of the Public Health Act, but it is a long way from the attainment of the ideal the sanitarian has set before him. For years in this country we have been trying to combat disease and abolish unhealthy surroundings. Millions have been spent in improved methods for dealing with refuse of all kinds; sewerage works have multiplied all over the land, and science and mechanics have joined hands to aid in providing economical and efficient means for treating the sewage. Great attention has also been given to the water supply, more particularly to that of the great cities. "Purity and plenty" has been the motto, and the most important engineering works of the period have been those carried out to meet the demand for its fulfilment. Our heating and lighting arrangements have been revolutionised, and that in a manner supposed to be in the direction of improvement, and beneficial to health. In many other ways the ravages of disease have been circumvented, and yet in spite of it all the waste of human life still goes on, and the national death-rate is 33 per cent. higher than it should be. The truth is that the efforts of the sanitarian are constantly counteracted by the developments of modern life. The physical conditions may be perfect; but if the mental worry is constant and the rate of living ever at high pressure, humanity breaks down under the load, and what is saved on the one hand is squandered on the other. Health and comfort are sacrificed to personal aggrandisement. Rational and life-giving food is neglected, and useless luxuries and irritating stimulants are indulged in. Recreation, which truly recreates the system and makes good the waste caused by the day's labour, is voted slow; and men cry out for the intoxication and excitement of sport and gambling, with their attendant evils. These are the things which keep up the death-rate, and until our countrymen realise the folly of the artificial existence they are creating, no efforts of the health worker will

succeed in bringing it down to a proper standard. The man's home may be clean, its surroundings perfect; but if the mind is disorganised—either by a craze for riches, for fame, or by selfish indulgence—so surely will he fail to reach the allotted span of three score years and ten.

The Sanitary Needs of the Old Bailey.

We recently directed attention to the defective sanitary arrangements of certain of the Government offices, and we have no doubt that were inquiry to be pushed further it would be found that many of our public buildings require looking into. A writer from the Temple makes complaint of the condition of the Old Bailey, that historic Court in which so many famous criminal cases have been conducted; and he mentions at least two specific cases in which the insanitary conditions under which they have had to do their work have led to the breakdown of the judges. Mr. Justice Wills had an illness after sitting at the Old Bailey trying the Lake cases; and Lord Alverstone, after trying the Yarmouth murder case, was not fit for his duties for nearly a fortnight after. Report has it that the unhealthy condition of this Court has also been responsible for other cases of illness among those whose professional duty has compelled them to attend it, and if this is so, the sooner the matter is remedied the better. The atmosphere of a criminal Court is seldom as salubrious as it might be, and especially during the protracted sittings of a popular and sensational criminal trial, when the presence of large numbers of the "great unwashed" make the place fœtid and unwholesome to a degree. But even making allowance for these necessary evils, it is discreditable that in this twentieth century any public Court should be allowed to remain in such a condition as to imperil the health of the judges who have to preside.

The Small-pox Epidemic in Scotland.

The reports from Scotland of the progress of the small-pox epidemic show a very much improved state of matters. Isolated cases continue to occur in various parts of the country, but for the most part they are not serious; and as the Authorities are everywhere keenly on the alert, and as re-vaccination has largely been taken advantage of wherever there is a threatening danger, little apprehension is now felt. Most of the cases that occur in other towns or in the country are traceable to infection from Glasgow. Two cases have, for example, broken out in the barracks at Belfast, and in both cases the soldiers had recently been in Glasgow, one on duty and the other on furlough. In Glasgow itself, for the last two or three weeks, the decrease in the number of cases in hospital has been steadily progressive. The official bulletin at the close of the week showed 220 cases under treatment, as against 275 at the commencement of the week. There is a small party in the Town Council that has been endeavouring to hamper the Health Department during the crisis in an irritating manner, but fortunately, being in a hopeless minority, their efforts do not do much harm. One gentleman wished to make a grievance out of the alleged refusal of the use of the Corporation Halls to certain lecturers who had come to the city to lecture on small-pox and its proper mode of treatment—presumably to discredit vaccination. Another showed great anxiety to have the report of a Sub-committee, appointed a considerable time ago, to inquire into the relations between the officials of the Health Department in which there had been some friction. To this the Lord Provost's very sensible reply was, that the Committee considered that the present was not a suitable time for such an inquiry, in view of the existing state of the city's health, when nothing should be done to disturb the harmony of the Health Department. Lord Provost Chisholm must be congratulated on the firm line he has taken in dealing with such vexatious troubles no less than on the activity and wisdom he has displayed at the head of affairs throughout the outbreak.

A Question of Liability.

An interesting decision is reported from Kirkcudbrightshire, regarding the liability of a Local Authority for failure to remove to hospital a case of infectious disease after notification. The household in which the case occurred consisted of a Mr. Gordon, his wife, their four young children, and five servants. On the afternoon of 9th August last one of the servants was found to have developed diphtheria, and the case was at once notified by the family doctor to the Medical Officer of Maxwelltown. The doctor also saw the Sanitary Inspector, and told him that in his opinion the servant should at once be removed. The same evening the Sanitary Inspector informed the doctor that his Local Authority declined to remove the case, and thereupon Mr. Gordon had the girl removed to hospital himself. His expenses in connection with the removal and the subsequent treatment in hospital amounted to £6 6s. 6d., for reimbursement of which he made a claim on the Local Authority, the Town Council of Maxwelltown. The claim being repudiated, he raised an action for the amount, alleging that it was impossible to properly isolate the servant in his house, and that her immediate removal was necessary in the interest of the public health, and of the servant herself, and that he had been put to expenses through the failure of the Local Authority to fulfil the duty of removal imposed on them by the Public Health Act. Sec. 54 of the Act, which imposes this duty, does so in the case of any person suffering from an infectious disease, "who is without proper lodging or accommodation, or is so lodged that proper precautions cannot be taken for preventing the spread of the disease;" and in this case the Local Authority disputed Mr. Gordon's statements as to the impossibility of isolation in his house, or the necessity for removal. Whether these statements were well founded in fact or not does not appear, for the Sheriff disposed of the case on a technical ground without any inquiry into the facts. He

held that the first duty of the Local Authority was to investigate the case, and to satisfy themselves of the necessity for removal. If they made an honest and *bonâ fide* investigation, even though their decision might be wrong, they would be protected by Sec. 166 of the Act; and before an action of damages could lie against them, it would have to be averred that they had failed or refused to investigate at all, or had contented themselves with what was not a *bonâ fide* investigation, and so had been in fault. As Mr. Gordon had not made any such averment, but had merely averred the failure to remove, which was not sufficient, the Sheriff thought the action must be dismissed. One cannot help feeling, however, that the decision was not altogether satisfactory. Certain correspondence which had taken place between the parties and the Local Government Board was produced in Court, and expressly referred to by the Sheriff in his judgment, from which it appeared that no investigation in the ordinary sense of the word was made. The Medical Officer, the Sanitary Inspector, and certain members of the Local Authority seemed to have simply discussed the matter among themselves, and come to a resolution without making any special inquiry into the circumstances of the case. If that was so, it seems regrettable that the Sheriff should have thought no proof was necessary.

Sanitary Certificates of Health Resorts.

The seaside season will soon be upon us, and paterfamilias will be looking round in search of a suitable venue for the summer vacation. To such a one the all-important question of health should carry weight no less than picturesque surroundings. As a matter of fact, some of the most popular resorts from the latter standpoint leave much to be desired on the former head. Outwardly they seem right enough, but their stuffy, ill-ventilated apartment houses are a direct menace to the healths of those who are destined to be immersed therein, and to this fact the Local Authorities are in many instances wilfully blind. In this respect Eastbourne furnishes a notable exception. This truly queen of Southern resorts possesses a system of granting sanitary certificates which practically ensures the visitor against any risk. What Eastbourne has done it is perfectly open for every health resort to do. The slight trouble entailed will be repaid many times over by the feeling of security that such a plan gives, and the corresponding increase in the influx of visitors during the season. Of course there is always a certain class of people who, through carelessness perhaps more than ignorance, affects to ignore this question altogether. It is the duty of the Sanitary Authorities to protect these. With such an excellent example before them there should be no excuse for neglect or procrastination. However picturesque or favoured by Nature a health resort may be, it ceases to become such in reality when its hotels, boarding-houses, and apartments are left free to disseminate disease by the indifference of those upon whom the bounden duty of protecting those who come there in search of health devolves.

Sanitary Inspectors' Associations.

LONDON.

An ordinary meeting of the members of the Sanitary Inspectors' Association was held on Saturday at Carpenters' Hall, London Wall, E.C. Mr. W. West (Walthamstow) occupied the chair, and those present included Messrs. H. Alexander, I. Young, Styles, A. Ashdown, A. G. Duck, Henley, S. C. Legg, Lear, Nurcombe, E. Tidman, C.E., the Hon. Secretary, &c.

Mr. T. G. Dee, the hon. treasurer of the Association, opened a discussion on the "Present Position of the Sanitary Inspector." He said that the Public Health (London) Act, 1891, would probably be the basis of alterations of law when the position as set out in the Public Health Act, 1875, is varied. He contended that primarily the tenure is not weak nor the salary often poor, nor sanitation impeded because of the defects in the law. The tenure and salary under Section 108 of the 1891 Act is that which the Local Government Board choose to make it, subject only to the limitation that they can only do that which 4 and 5 William IV., cap. 76, Section 46, gives them power to do in the case of a District Medical Officer. This provided that the officer should hold his appointment until he shall die, or resign, or be proved to be insane. Such a tenure as this and a proper salary surely was all that a Sanitary Inspector need ask, and it could be obtained without further legislation, but they had only been accorded by Art. 10 of the General Order of the Local Government Board of the 8th December, 1891, the position that every Sanitary Inspector shall continue to hold office for such period as the Sanitary Authority may, subject to their approval, determine at the time of his appointment, or until he die or resign, or be removed by such Authority, or by the Local Government Board, or be proved to be insane. Art. 14 of the same Order decided the amount of salary to be such as may be approved by the Local Government Board, no power being given to that Board to direct what salary shall be paid. With respect to the legal powers of Sanitary Inspectors to deal with nuisances, he was of opinion that all or almost all he requires is to be found in the law as set out in the Public Health (London) Act, 1891. The question therefore rose, viz., whether or not the administration is defective? It might be accepted that certainly the tenure of office might be much improved if the Local Government Board could be induced to administer their powers in as liberal a spirit as has been done with district Medical Officers of Poor Law Unions. He therefore claimed that the present administration of the law is detrimental to the true interests of the public by leaving the Sanitary Inspector's position liable to be taken from him in consequence of a due fulfilment of his duties when that is against the personal interest of his direct employers. The Local Sanitary Authority were at times very diffident in enforcing all the powers they possessed, the law was enormously strong and very clear, yet they all knew that it is frequently not fully administered. What an unsatisfactory position for the Sanitary Inspector who by the direct order of the Local Government Board reports such breaches and then finds that he is unable to do anything, strong law notwithstanding. The varieties of methods adopted by the different authorities in dealing with the duties of Sanitary Inspectors prevents full fruition of his work. Then, again, administration frequently failed because of the

nominal fines inflicted, in his discretion, by the magistrate. Dealing with the personal aspect of the question, Mr. Dee said egoism was useful to the Inspector in his work, as it tended to make him faithful to his duties, but the very power Sanitary Inspectors possessed as officials had a strong tendency to so foster this spirit of egoism as to make them almost forget that it is the position which the law has made which carries the power, and begin to think that it is to themselves and not to their office that the expected deference is paid. When personality gained the upper hand of a humble desire that their office should be magnified, they as individuals commenced to deteriorate, and their work suffered by the consequent loss of influence on others, their judgment is weakened, and they were unable to make due allowance for an opposite opinion to their own. He urged them to endeavour to leave the position of the workmen and his foreman in manners, dress, and speech, and to endeavour to rise to the professional status. Until they worked together in this way Sanitary Inspectors would not advance in the eyes of the public and their representatives on Sanitary Authorities as a body of professional men. They should be able to take up one or other of the undoubted hardships that Sanitary Inspectors meet with, and obtain wide publicity for their njustices. In conclusion, Mr. Dee urged that they must press the Local Government Board to give Sanitary Inspectors a better tenure of office; they must urge and educate the public to send the very best men as their representatives on Sanitary Authorities—men who had no axes, political or otherwise, to grind; magistrates must be urged to see eye to eye with sanitarians when the Inspectors were compelled to bring bad cases before them; but he believed that the elevation of their profession as a whole would do more than anything to bring about the legitimate ends they all had in view.

Discussion followed, and a hearty vote of thanks was accorded to Mr. Dee, and on the motion of Mr. I. Young, it was further resolved to refer to the Council of the Association the question of considering the advisability of making representations to the Local Government Board as to amending the Order of 1891, so as to secure the position of the Sanitary Inspector, as provided by the Public Health (London) Act, 1891.

A vote of thanks was accorded to Mr. West for his effort in arranging an interesting visit to the various municipal undertakings of the Walthamstow Council.

MR. HOOLEY AS A SANITARIAN.

Having retired from active service in the field of finance, Mr. Hooley is devoting himself to the solution of sanitary problems. The housing of the rural poor has apparently found in Mr. Hooley a sturdy, practical exponent, for some cottages recently erected on his estates of Eltisley and Papworth have received high encomium from the Medical Officer of Health for the district. The cottages are built upon concrete foundations, they are large and commodious, and are most admirably fitted with all sanitary arrangements, and dry-earth self-acting closets are fixed for each cottage at some distance from the house. The water supply is ample. The cottages are mostly built in pairs.

Each cottage has its own water-butt for collecting the rain-water from the back part of each house, and there is for each two cottages a large underground cemented reservoir for receiving the rain-water from the other portions of the roof.

Each pair of cottages has also a well 20ft. deep, and is provided with a cast iron pump. The water afforded is somewhat brackish, as coming from the clay, but is free from vegetable or organic matter. There is a good garden for each house and ground at the back. The wells are situated in each case in the front gardens. These cottages are perfect models of cottages for the agricultural labourer.

Mr. Hooley has erected three pairs in Eltisley and six pairs in Papworth, making a total of eighteen tenements, and two other pairs are in course of erection, and the ground for several new pairs is staked out, added to which he has also built new schools of the most modern type for the village of Papworth.

It is Mr. Hooley's intention to build many more of these most desirable cottages upon his estates.

SEWAGE DISPOSAL IN INDIA.

Some interesting and successful experiments connected with the purification of liquid sewage and sullage water have been carried out in the Howrah municipality by Mr. A. Hale, M. Inst. S.E., superintendent, in charge of the Conservancy Department. The process employed is a combined biological and mechanical one, and the operations consist in passing the highly foul and offensive liquid through a specially designed primary filter constructed on the "Scott Moncrieff" principle, by which upward filtration is obtained and a secondary process of downward filtration through bacteria beds. The material contained in the primary filter is nothing more than pieces of coarse broken bricks, clinker, and cinders, arranged in alternate layers; and the sewage while passing slowly upwards through these substances is vigorously operated upon by numerous micro-organisms which attack and eliminate the putrescent suspensory matters contained in the sewage, and the effluent leaves the filter smelling strongly of sulphur, but otherwise practically free from solid organic or offensive substances. On leaving the primary filter, the effluent is led over a broad weir and into the bacteria beds, for final purification and oxidation before escaping into the outfall drains. The bacteria beds consist of layers of earth and fine cinders and are about 3ft. in depth, and the effluent filters slowly through, by percolation, emerging from the under drains; in colour a deep brown, and with still a slight odour of sulphur, which is said to entirely disappear as the effluent flows away. The filters and bacteria beds, besides being inexpensive to make, are almost continuous in their action, and require no skilled supervision, when once set going, to maintain the best results; the only precaution necessary is to prevent hard foreign substances, such as stones and sticks, being introduced into the former, and to scrape off the thick scum which forms on the surface of the bacteria beds every week or so.

A letter has been sent by Mr. Noel T. Kershaw, Assistant Secretary of the Local Government Board, to the Clerks of the Authorities interested in the recent application by Stockport to extend its boundaries. In it he informs them that he is directed to state that they have received the report made by their Inspector, Mr. Tulloch, after the inquiry held by him with reference to the representation of the Town Council of Stockport in favour of an alteration of the boundaries of the borough. The Board, having carefully considered the evidence given at the inquiry, together with the report of their Inspector, have come to the conclusion that the facts are such as to warrant some extension of the borough, and they propose to issue a Provisional Order for including within its limits the whole of the urban district of Reddish, part of the urban districts of Bredbury and Romiley, Cheadle, and Gatley, and Heaton Norris, part of the urban district of Hazel Grove and Bramhall, and a part of the parish of Brinnington. The boundaries of the areas to be added to the borough are defined by a hard red line on a map which has been forwarded to the Town Clerk. The result of the extension will be that the acreage of the borough will be increased from 2200 to 5600, and the population from 82,000 to about 100,000.

Public Works.

SEWERAGE.

THE Hay Council, N.S.W., has accepted the Government offer to sewer the town at a cost of £17,000.

COLONEL W. L. COKE has held an inquiry at Erdington into an application of the Urban District Council for sanction to borrow £8000 for works of sewerage and sewage disposal.

A SPECIAL meeting of the Exmouth District Council was held last week, when the Council's seal was affixed to the Public Works Loan Board to deliver to Mr. Darke a certificate for £5000, being the fifth instalment of the loan of £33,150 for works of sewerage.

THE Local Government Board has sanctioned the proposal of the Barrow Rural District Council to borrow £1945 for the purpose of sewerage and sewage disposal at Newtown Linford, also the borrowing of £7000 for the execution of sewerage and sewage disposal works at Woodhouse Eaves.

THE Secretary for Scotland has intimated a general approval of the scheme prepared by Mr. W. A. Carter, C.E., for the purification of Dumfries sewage. Works for bacterial filtration are to be erected in the garden at Castledykes, a residential property which the Town Council has bought for the purpose.

MR. M. K. NORTH, an Inspector of the Local Government Board, attended at Fletton last week to inquire into the application of the Norman Cross District Council for power to borrow an additional £6500 to complete the drainage scheme. After hearing evidence, examining the plans, and visiting the works, there being no opposition, the inquiry was closed.

COLONEL A. C. SMITH, C.E., of the Local Government Board, held an inquiry at Little Hulton into the application of the District Council for consent to deviations in the sewerage scheme, in respect of which a loan of £13,000 was sanctioned seventeen years ago. Evidence was tendered in support of the application, after which the Ellenbrook sewage works were visited.

COLONEL MARSH held an inquiry at Egremont last week, into the merits of an application made by the Wallasey Urban District Council for permission to borrow £12,500 for the purposes of extending the electric lighting system of the district, £5860 for works of sewerage, £5800 for provision of public conveniences at New Brighton, and £3000 for purposes of street improvements.

AT a recent meeting of the Sewerage Committe of Aberdeen Town Council an application was received from Messrs. Richards, Limited, for leave to run off the surface water from the proposed new works at the south side of the bridge of Dee, to join the river east of the bridge. As this would mean something like 500,000 gallons a day, the Committee deferred the matter for inquiries to be made.

THE Withington Urban District Council has accepted the Main Drainage Committee's recommendation that the tenders of Messrs. Nowell, of London, for contract No. 3 for the sum of £22,964, and for contract No. 4 for £21,612 be accepted. The former related to the construction of new main outfall sewers from the sewage farm to a point near Hough End Hall, Nell-lane, Chorlton-cum-Hardy, and the other to the construction of new main outfall sewers from a point in Withington-road, Whalley Range, to near Hough End Hall, and forward to a point near the corner of Burton-road and Lapwing-lane, West Didsbury.

ACCORDING to a recent report, says the *Engineer*, the expectations of the constructors of the Chicago Drainage Canal, which was made for carrying away the sewage of the city, containing over a million inhabitants, have been realised. The idea of pouring the sewage of a large city, amounting to 50,000 cubic feet a minute, into an open channel, and allowing it to flow away without any attempt at purification, was startling. It appears, after eight months' working, none of the actions threatened by the towns bordering on the river below Chicago have been commenced, and it is reported by competent authorities that the water in the canal is free from objectionable features.

SANCTION has been obtained to the borrowing of £17,423 for sewerage works, and £510 for pumps and machinery at Altrincham.

AT the last monthly meeting of the Colwyn Bay District Council it was reported that the new drainage scheme was estimated to cost £59,978. The report, plans, and estimates have been submitted to Mr. Baldwin Latham for expert opinion thereon. The Finance Committee reported that from a summary of receipts and expenditure for the financial year it appeared that the net income had amounted to £14,430, an increase on the estimate of £430, and the net expenditure had reached £14,160, an excess over the estimate of £460. It appeared that a sum of £2,615 was due from loans, and that £1,912 was unexpended on account of loans. The net balance due to treasurer on the 31st ult. was £681.

WATER.

IT has now been definitely stated that further opposition to the Prestatyn Water Bill will be raised in the House of Commons on behalf of Mrs. Rowley Conwy.

THE Town Council of Denny has resolved to instruct its Engineer, Mr. Frew, Glasgow, to proceed with the erection of a supplementary reservoir in accordance with plans prepared, and to issue schedules to contractors with a view to have the work in hand as early as possible.

A MEETING has been held at Ilford for the purpose of passing a resolution of owners and ratepayers of the urban district to give consent to the Council opposing a Bill which is being promoted in the present session of Parliament by the South Essex Waterworks Company, to construct further works and extend their limits of supply, and for other purposes.

AT its last monthly meeting the Kirkintilloch Town Council fixed the contract for the construction of a new reservoir to contain 40 million gallons. The work was given to Mr. James Miller, contractor, Kirkintilloch, at the contract price of £19,937. Mr. Miller is presently engaged at the Duntocher and Dalmuir waterworks, and it is expected this new work will be three years in progress.

DR. W. H. WEBB, in his annual report on the health of the Kingsbridge district, referred to the need of a more adequate water supply for the town, and strongly advised the Council to adopt the Infectious Diseases Prevention Act of 1890, whereby more adequate powers were vested for suppressing the spread of all dangerous infectious diseases likely to be disseminated by the sale of infected milk, &c.

COLONEL LOCKWOOD, M.P., presiding at the half-yearly meeting of the East London Waterworks Company, expressed satisfaction at the rejection of the Purchase Bill of the London County Council, questioned the soundness of the assumption that the acquisition of the water undertakings was really desired by the ratepayers, and declared that the political capital and gross misrepresentations that were made at the County Council elections out of the proposed new regulations would be a disgrace to all concerned.

AT the meeting of the Wolverhampton Town Council on Monday the Water Committee submitted a report with regard to the water supply for the borough. It states that the scheme for augmenting the supply by establishing new works at Worfield having been rejected by Parliament, it has become desirable that a previous suggestion for filtering the brook water at Cosford should be carried into effect. The Engineer is of opinion that the best way of treating the water is to adopt mechanical filters of the gravity type, which, whilst possessing similar features to ordinary filter beds, will treat large volumes of water in a very little space, without requiring constant attention or the employment of a large staff to renew and wash the filter media. Mechanical filters of the gravity type perform their work in the same manner as ordinary filter beds, but, instead of relying on zoogloea for arresting and collecting bacteria, a solution of sulphate of alumina is used to form the gelatinous film on the face of the filtering media. The makers of this particular plant are prepared to guarantee that the filtered water shall be bright, clear, and practically free from turbidity and matter in suspension and colour. The cost of the work is estimated at £3500, and the Committee recommends that it be empowered to expend this sum in providing such a plant.

Messrs. R. Laidlaw and Sons, Glasgow, have secured the supplying of the water mains for the Edinburgh and District Water Trustees at a cost of £2530.

The fortnightly statement of the Edinburgh and District Water Trust shows that the delivery in Edinburgh per day was 16,586,000 gallons, equal to 39·49 gallons per head each day. The total quantity of water in the reservoirs at April 9th showed an increase of 3,087,000 gallons compared with March 26th. The rainfall at Glencorse from January 1st to date was 8·82in., against 11·90in. last year. At Gladhouse it was 7·24in., as compared with 10·89in. last year.

Last week the formal opening of Lochcote Waterworks, the property of Bo'ness Town Council, took place at Lochcote House. A large number of representatives of the public bodies, the engineers and contractors, along with a number of ladies, were present at the opening ceremony. After the water was turned on the company repaired to Lochcote House, where dinner was served, and a large toast list entered into. The capacity of the new waterworks is 200,000,000 gallons, and represents a total cost of £29,105. Messrs. Leslie and Reid, Edinburgh, were the engineers who planned the work, and Messrs. Peattie contracted.

A very satisfactory report as to the state of the reservoirs was made to the Manchester Waterworks Committee last week. It was stated that since April 1st there has been a rainfall of 1¾in. at Longdendale, which is about ½in. more than during the same period last year. This has largely augmented the stock, and the reservoirs are full. There is at present a supply of 5153 million gallons, against 4578 million gallons last year. This gives 126 days' supply, against 112 last year, or, with the yield of the springs, a supply sufficient for 160 days. At Longdendale a good deal of water is running to waste, owing to conditions which in course of time will be remedied, and at Thirlmere the water is running over the sill. The Waterworks Committee feels that there need be no fear of a scarcity of water during the coming summer.

LIGHTING.

The Malvern Urban District Council proposes to spend £13,000 in completing the gasworks at Malvern Link.

The Colchester Corporation has decided to borrow £3900 for the purpose of extending its electric lighting station.

The capital of the Andover Gas Company is to be increased from £8000 to £14,000, to enlarge the works to cope with the growing needs of the town.

The Hull Town Council has decided to spend a further £17,000 in works of electric lighting, and £900 in constructing an underground lavatory in the Market Place.

At a recent meeting of the Electric Lighting Committee of Leith Town Council it was resolved to recommend the Council to reduce the price of electric energy for lighting purposes from 5d. to 4d. per unit, there being now about 280 consumers connected with the mains, or an equivalent of 25,830 eight-candle-power lamps.

At the meeting of the members of the Accrington and District Gas and Water Board, held last week, the Board's seal was affixed to two loans of £1000 each. Tenders for six months' supply of tubes and fittings were accepted. The Clerk was instructed to apply to the Local Government Board for further borrowing powers for the laying of water mains for a period of three years.

At the last monthly meeting of the Morecambe Urban District Council, the Chairman of the Gas Committee congratulated the town on coming into possession of its gasworks. Although some had said the purchase price of £141,000 was high, he noticed Osset had just paid a bigger sum for its works. The former Committee had rather muddled the negotiations for a loan, but he was glad to say the Committee of which he was Chairman had, since December, not only completed the purchase, but saved the town £1500 in procuration fees, an amount which would have had to be paid if the money had been secured through London agents. The Committee hoped to introduce the meter system of prepayment for lighting and cooking purposes, and it did not anticipate the acquisition of the undertaking would greatly affect the rates.

A Local Government Board inquiry has been held into the application of the Peterborough Town Council to borrow £12,200 for electric lighting purposes.

The Local Government Board has written the Wolverhampton Town Council sanctioning the borrowing of £59,942 for the purposes of supplying electricity.

Intimation has been received at Nuneaton that the Board of Trade proposes to grant, subject to certain modifications and amendments, the provisional order necessary for the extension of the undertaking of the Nuneaton Gas Company. The application of the company was to raise additional capital to the extent of £50,000, but the commissioner who held the inquiry on behalf of the Board of Trade suggests that the sum be £40,000.

Mr. W. S. Johnson, of Sheffield, has been appointed Clerk of Works in connection with the electricity works of the Heywood (Lancs) Corporation, at a salary of £2 per week. These works are to be established at a cost of £15,000. The Local Government Board has declined to sanction a loan of about £2000 to enable the Heywood Corporation to wire consumers' premises free of charge on the ground that the granting of sanction for such a loan would establish an undesirable precedent.

The Skipton Urban Council is carrying out extensions of the gasworks acquired for the town a year ago. The latest project is to convert the ammoniacal liquor into sulphate of ammonia, and acting upon the advice of its consulting engineer (Mr. Porter, of Elland), the Council has sanctioned the scheme, which, for the remarkably modest investment of £450, is calculated to bring in the handsome return of over £200 per year. The Council has also decided to erect a new governor house. On the first year's working there is a small profit, notwithstanding the inflated price of coal.

At a crowded meeting of Winsford property owners and ratepayers last week, the Urban Council asked for sanction to deposit a late Bill in Parliament to empower it to manufacture and supply gas and provide for the transfer to the Council of the local gas undertaking. Some time ago the Council resolved to purchase the works for nearly £16,000, the price fixed by the arbitrator. The Local Government Board, however, refused to sanction the loan unless a provisional order or Parliamentary Bill was obtained. After a lengthy discussion the ratepayers decided by an overwhelming majority to withold consent. A poll was demanded, and will take place early in May.

Greenock gas consumption continues to decrease. Since July 1st last—a period of nine months—the decrease has been no less than 3,340,900 cubic feet compared with the previous year. Last month the gas consumed was less by 61,700 cubic feet than in the March of 1900. It is noteworthy that in the nine months referred to, while the gas consumed has shown such a shrinkage, only 260 tons less coal were used at the works. The popularity of electric light is the principal cause of the reduction in the consumpt. Greenock Police Board, however, intends to extend the gasworks shortly, and to improve the methods of production, at an estimated cost of nearly £50,000. Last week the Board decided to ask powers in its new Provisional Order to borrow £100,000 for this purpose.

GENERAL.

The Ashford Urban District Council is expecting the sanction of the Local Government Board for the purchase of a site for an infectious diseases hospital.

A Local Government Board inquiry has been held at Derby with reference to the application of the Town Council for sanction to borrow £1175 for the purpose of street improvement.

A Local Government Board inquiry has been held at Yarmouth with reference to the application of the Town Council for sanction to borrow £7500 for the improvement of the foreshore at Gorleston, and £2580 for works of paving.

The Electric Lighting and Traction Committee of the Batley Corporation has received from its Engineer (Mr. Clirehugh) an estimate of the cost of laying and equipping the tramways authorised by the Order obtained last year. The estimate is over £50,000, exclusive of the electricity generating station and plant.

A NEW joint isolation hospital, which has been built by the Romford Urban and Rural District Councils at a cost of over £10,000, has been opened at Rush Green, Dagenham, Essex.

THE Rochdale Town Council has decided to proceed at once with the proposed tramways extension, and has instructed the Borough Surveyor to carry out the same by direct labour.

THE Local Government Board has consented to the raising of money by the Southend Town Council for the housing scheme, and the Borough Surveyor has been instructed to prepare details, with a view to the invitation of tenders.

AT a recent meeting of the Dewsbury Joint Hospital Board a call for £3000 was made upon the several townships, the money to be devoted to the erection of the hospital at Mitchell Laithes, of which a considerable portion is already constructed.

THE formal opening of the Stockton refuse destructor, which has been erected by Messrs. Horsfall and Co. for the Stockton Corporation in the Corporation Yard, Richmond-street, at an estimated cost of £3091, took place last Thursday. The main buildings contain two Horsfall patent-type cells, each of which is capable of burning ten tons of refuse in every twenty-four hours.

THE Hampstead Borough Council having recently adopted Part III. of the Housing of the Working Classes Act, 1890, has instructed its Public Health Committee to make full inquiry into the nature and extent of overcrowding in the most thickly-populated streets of the borough. In order that this may be done effectually several additional sanitary inspectors have been appointed, including Miss A. Gough.

THE Local Government Board has now approved of the terms of agreement for the proposed Central Combination Hospital for infectious diseases to be erected at Netherclough for the use of patients in the Lockerbie district and the burghs of Lockerbie, Moffat, and Lochmaben. In addition to the joint hospital the agreement approved of by the Local Government Board provides for a common hospital for the use of persons within the limits of the combination who may be suffering from small-pox, as also a sectional hospital, or hospitals, for patients who cannot be removed to the central hospital.

THE Chelsea Borough Council has this week considered a proposal to erect new public baths on a site acquired by the late Vestry adjoining the Town Hall. The scheme includes the provision of about 100 private baths and three swimming baths, the largest being 100ft. by 35ft.; whilst one, 60ft. by 25ft., will be reserved for ladies, for whom about fifty private baths will also be provided. The cost of carrying out the scheme, exclusive of the price of the site, is estimated at between £60,000 and £70,000. The Public Baths Committee reported that a scheme for public wash-houses can be carried out on land adjacent to the site, but that additional land would be required, and the cost would be from £8000 to £10,000. It is not contemplated that action on the latter proposal shall be taken for at least another twelve months.

AT the last meeting of the Sanitary Committee of the Dundee Town Council reports were submitted relative to the employment of female Sanitary Inspectors in other cities. It was stated that in Liverpool there were eight female Sanitary Inspectors. Their duties consisted chiefly of house-to-house visitation of the dwellings of the poor, the object being to induce cleanliness and an observance of the laws of sanitation in compliance with the requirements of the Local Authority, and of seeing that the Factory and Workshops Acts, as applicable to premises wherein females are employed, were duly attended to. The salaries of these officials ranged from 30s. to 35s. per week, and it was reported by the Medical Officer of Liverpool that their services were of great value. In Manchester it was reported that there were two female Inspectors, in Glasgow seven, and in Greenock one at a salary of £50. In each of these cases it was stated that the work they performed was highly prized by the Local Authorities in question. The information contained in the reports referred to was remitted to the Medical Officer and the Sanitary Inspector to consider and report to the Committee, which will thereupon formulate such recommendations as they may consider judicious for the determination of the Town Council.

THE Liverpool Health Committee proposes to ask the City Council to place at its disposal a sum not exceeding £150 for the purpose of entertaining the members of the Congress of Sanitary Inspectors when the latter visit Liverpool.

THIS week Newcastle-upon-Tyne is passing through a curious experience. The lease of the tramways to the Newcastle Tramways Company expired on Saturday, and the tramcars ceased running throughout the city. The Corporation is installing a service of electric tramways on the overhead trolley system, but it will be at least six months before this is complete. They have endeavoured to keep the existing system going while constructing the new one, but found that it delayed the work. It would seem that the public have no alternative but to put up with the inconvenience thus caused.

LAW CASES.

Lodging-house Inspector's Unsuccessful Action.

AT Swinford Quarter Sessions last week, before Judge Deane, the case of Sub-Sanitary Officer Hurst came on for hearing. This was an action for £50 against the Swinford Rural District Council, salary alleged to be due to plaintiff for his services as Common Lodging-house Inspector. Messrs. M. J. Kelly and J. P. Mannion for plaintiff; Messrs. P. O'Connor and John Garvey for the District Council.

The plaintiff gave evidence that he was appointed in 1888 by the Swinford Board of Guardians as Sub-Sanitary Officer, and during that time he acted as Inspector of Common Lodging-houses. Latterly the duties in that respect have increased, owing to the energy and vigilance of Sir Achison McCullagh, and plaintiff now claimed £50 for the extra work.

Mr. GARVEY contended that the plaintiff had no case, inasmuch as he was bound as Sub-Sanitary Officer to inspect and report on common lodging-houses and everything of an unsanitary nature, and nothing of a more unsanitary nature could come under his notice than an overcrowded lodging-house; hence he was bound to do these duties, and in support of his contention quoted Sections 11 and 78 of the Public Health Act, from which it would be seen that the position of Sub-Sanitary Officer and Inspector of Common Lodging-houses were not two distinct offices.

Mr. KELLY argued *contra*, and stated that the salaries of Inspectors of Common Lodging-houses had been fixed in three unions.

Mr. GARVEY challenged this statement, and said that the present case was the first of its kind tried in Ireland.

His HONOUR concurred with Mr. Garvey, and held that nothing could be more unsanitary than an overcrowded lodging-house, and it was once the origin of the greatest outbreak of fever that ever swept over Europe. The action was unfounded and preposterous, and he would dismiss it with full costs and expenses.

The Liabilities of House Agents.

AT the Loughborough Petty Sessions, before Rev. R. Burton and other magistrates, William Armstrong, house agent, Loughborough, was summoned at the instance of the Loughborough Corporation for that he, being the owner of a house in Rectory-place, failed to comply with an order of the Urban Sanitary Authority requiring him to provide proper and sufficient down-spouts and cross-gutters, so that the rain water should not flow over the footpath.

The Town Clerk, Mr. H. Perkins, prosecuted, and Mr. H. Deane defended.

The TOWN CLERK said the original Act under which the proceedings were instituted was the Town Improvements Clauses Act, 1847, which was embodied in the Public Health Act, 1875.

Mr. DEANE said there was no dispute as to the spouts and gutters being required. But Mr. Armstrong was not the

owner. His firm were the collectors of the rents, and they had been distinctly told by the landlord not to do the work, and if they did they could not recover.

Mr. PERKINS contended that under the Public Health Act definition of owner the Authority were empowered to proceed against the receiver of rents. It might be very hard on Mr. Armstrong if the actual owners gave him orders not to do the work, in defiance of the Authority, but that was so much the worse for him, and it did not relieve the Authority of their duty in seeing that these down-spouts and cross-gutters were properly fixed. These proceedings had arisen from the complaint of persons resident in the neighbourhood. Similar orders were served on adjoining owners, and had been complied with, and the Authority felt they could not allow this matter to pass. Every opportunity had been given to Mr. Armstrong to get the work done, and he had explained his position, to which he (the Town Clerk) had replied that he would be justified in doing the work himself, and deducting it from the rent.

Ralph Lord, Sanitary Inspector under the Corporation, proved the necessity for the work, and the notices issued.—Cross examined: He had not ascertained that Mr. Wm. Armstrong himself had never received a penny of this rent, but knew he was a member of the firm of W. and F. Armstrong.

Mr. PERKINS also gave evidence, stating that Mr. Armstrong had explained his position to him, and that Mr. Rickard, one of the trustees of the property, declined to allow him to carry out the work ordered by the Authority. Witness told him that in his opinion he could do the work himself and deduct the cost from the rents.

In cross-examination, the TOWN CLERK said he contended that for the purpose of this Act the rent collector was the owner against whom the Authority ought to proceed. He did not consider they ought to proceed against Mr. Rickard, for he would say, as Mr. Armstrong did, that he did not keep the rent, but handed it on to someone else. His opinion was that an agent was justified in doing what was necessary to save himself from the action of the law, and he did not think any principal could compel his agent to act contrary to the law. Witness had seen the telegram received that morning from Mr. Rickard stating that if the summons was withdrawn he would undertake to have the work done at once. The proceedings were not pressed in order to see if all agents could be made responsible, and so the Authority could avoid having to find out the owners, and proceed against them. He considered it was too late in the day to make this offer, and he could not get instructions from his Committee to withdraw the case.

Mr. DEANE said the Corporation had the option of proceeding against the actual owner, the occupier or the agent, and they had chosen to go against the one person who, if he spent the money in doing the work had no power to get it back, because he would be acting outside his instructions. An important point was raised by this case, important to Mr. Armstrong and other rent collectors, whether the Corporation was right in the contention that they might drop the occupier and actual owner and go against the rent collector. A further point was that Mr. Armstrong was only a receiver of rents and was not therefore an agent. The case was a distinct hardship on Mr. Armstrong, for he stood between somebody and the deep sea. On the one hand he was told if he did the work he would not be allowed for it, and on the other he was summoned for not doing it.

Wm. Armstrong, the defendant, went into the box, and stated that personally he had had nothing to do with these houses, and had never received any of the rents, his son having done that. His firm had nothing to do but receive the rent and hand it over, and they were not the agents for the property, but simply the rent collectors. If he had been free he would have had this work done, but he was specially instructed not to.—Cross-examined: If one of the houses became empty, they would do their best to let it again, and they would accept notices from the tenants.

The Bench having consulted, the CHAIRMAN said they had come to the conclusion that Mr. Armstrong was the technical owner of the property, and they would therefore make the order for the work to be done.

Mr. PERKINS said it was a case for a penalty for non-compliance with the order already made by the Corporation.

The Bench then imposed a fine of one halfpenny a day for the 28 days, the period of non-compliance alleged in the summons.

NOTES AND QUERIES.

Subscribers may obtain advice on matters appertaining to Public Health Law and Municipal and Sanitary Engineering. Letters should be addressed "Notes and Queries," THE SANITARY RECORD, 5, Fetter-lane, London, E.C. If an answer be required immediately, a stamped addressed envelope must be enclosed

2162.—SEWER DISCHARGING IN TIDAL RIVER: CONSENT OF BOARD OF TRADE REQUIRED.—"Surveyor" writes:—"My Council have recently let a contract for making a sanitary pipe sewer which has its outlet into a tidal river, and have received a request from the Board of Trade and also from the Commissioners of the river for plans and sections of the work, showing high and low-water mark, and any works which are intended to be laid down for the purification of the sewage before discharging it into the river. They also ask to be informed 'how many gallons per day' of sewage we intend to so discharge. Can either or both of them demand legally to be supplied with any or all of these particulars and plans? It is ordinary household sewage from a locality where there are very few water-closets. I had an impression that a District Council could without let or hindrance discharge ordinary sewage into any tidal river which the Local Government Board had not declared to be a stream, and this is the position of ours. Can you please enlighten me on this point also?"

Answer.—The Local Authority must comply with the requirements of the Board of Trade and River Commissioners, and submit plans to them as required. See Sec. 327 of the Public Health Act, 1875. The consent of these bodies must be obtained to the plans before proceeding with the work.

2163.—COMPENSATION FOR LAYING SEWER: ARBITRATION.—"Plymouth" writes:—"My Council have recently had a pipe sewer laid through agricultural land, the work being done by a contractor who was required both by signed agreement and specification to pay all surface damage. The claim for the surface damage was £50 for 822 yards of 9in. sewer through land let for 10s. per acre. The claim was made to the Council, as the farmer would not deal with the contractor. The contractor offered to pay £10 either direct or through the Council, this the farmer would not accept, and demanded of the Council arbitration. This was agreed to by the Council, and the award was £37 and expenses. The contractor's agreement entitled him to monthly payments on work done, less 10 per cent., which he was to have after the work had been three months finished. Six months and more have now elapsed, but the Council still retain sufficient of the contractor's cash to pay the claim for damages and expenses, and intend to do so. What I should like to know is: (1) Can the Council detain the contractor's money beyond time mentioned in agreement, in view of his not settling such claims as the foregoing? (2) Can they under the above circumstances legally appoint an arbitrator and pay the award given by his arbitration, expenses *re* same, &c., out of this money retained? (3) Can they or can they not lawfully refer the farmer to the contractor and decline to arbitrate or otherwise deal with him regarding the claim in question? Can you quote any case law on all or any of these points?"

Answer.—(1) Subject to the conditions in the contract, the Council may retain the money. (2) Yes. (3) No. The Local Authority are responsible, and they should not decline to arbitrate.

2164.—DRAINAGE OF HOUSES: EASEMENT.—"Q." writes: "Six houses within one curtilage are provided with earth closets, but have the slop drains discharging into a ditch. The owner of the latter has given the owner of the houses notice to cease using the ditch as the drain outfall. The house owner has written me for advice. Will you kindly advise (1) Whether the duty of providing for the disposal of the sewage is cast upon the Authority or the owner? (2) Whether the owner can cut off the connection of the drains with the ditch? (3) Whether there is any simple method of dealing with slop water?"

Answer.—(1) A Local Authority is not required nor can they be compelled to provide for the disposal of sewage for isolated groups of houses. Where no sewer exists, the Local Authority may require the owners to construct cesspools and to drain thereinto, or into such other place as they may direct, as provided by Sec. 23 of the Public Health Act 1875. (2) Not if the owner has acquired through long usage an easement or right to drain into the ditch. (3) Yes. See Thudichum's "Bacterial Treatment of Sewage," price 1s. 3d., obtainable from this office.

2165.—TENTS, VANS, AND SHEDS: BYE-LAWS IN RESPECT TO.—"Surveyor" writes: "I should be pleased to know if Model Bye-laws have been issued under Sec. 9 of the Housing of the

Working Classes Act, 1885, with respect to 'tents, vans, and sheds used for human habitation,' and how such are obtainable."

Answer.—Model Bye-laws with respect to tents, vans, sheds, and similar structures used for human habitation, have been issued by the Local Government Board, and copies of such may be obtained on application to the Board. Annotated copies of such bye-laws may be found in Mackenzie and Handford's "Model Bye-laws," price 25s., obtainable post free at the price named from the office of this journal.

2166.—Water Supply: Power of Local Authority.—"J. W." writes:—"I have obtained a sample of water from a dip well which is used for domestic consumption by the occupiers of three cottages situate in an outlying portion of this district—500 yards from the nearest main supply of water. The analyst's report states that the water is contaminated with organic impurities of a dangerous character, and is unfit for drinking. What powers have this Council to obtain a suitable supply? Can they proceed under Section 70 of the Act of 1875, or does this only apply to rural districts?"

Answer.—If the existing supply of water cannot be made fit for domestic purposes, the Local Authority may obtain an Order under Section 70 to close the well. The owners of the houses may be required to provide a proper supply of water under the provisions of Section 62 of the Act of 1875. A report from the Surveyor of the Urban Authority will be necessary.

2167.—Sanitary Inspector: What are Restrictions as to Age.—"G. W. H." writes:—"Would you kindly advise me whether there are any restrictions as to the age for Sanitary Inspectorships? I notice that advertisements generally prescribe the age to be between 25 and 45 years of age."

Answer.—Excepting that persons under 21 years of age cannot be appointed to the post of Sanitary Inspector, the only restriction is that imposed by Local Authorities that candidates must not exceed 45 years of age. It will rarely be found, we think, that the age is specified to be above 45 years.

2168.—Leaflets for Distribution as to Small-pox.—"J. M." writes:—"Will you kindly inform me where I can procure suitable leaflets for distribution among householders giving precautions to be observed against small-pox?"

Answer.—Leaflets on this and numerous other subjects in connection with sanitary precautions are published by the National Health Society, 53, Berners-street, Oxford-street, London, W., and are supplied at a cheap rate.

2169.—Drainage of House Approved by Local Authority Subsequently Found Defective: Whether Authority Liable.—"R. T." writes:—"At a new house which was recently erected in my district, the drains were tested by me for soundness with the smoke machine. After some defects were remedied I was satisfied as to their soundness. Prior to a certificate for occupation being given I gave my opinion that the drains were satisfactory. Before the house was occupied the lessee had the drains tested by a private sanitary engineer, who found a small defect or two in the drains by using the smoke test. The water test was then applied, when it was found that the drain could not stand such a test. The lessee has now had all the drains taken up from end to end, the pipes being broken in so doing. The drain, I may add, was not tested by me after the ground was filled in. Will you please advise (1) Whether the house having been passed as fit for occupation, can the lessee successfully sue the Local Authority for the cost of the new drain? (2) Can the incoming tenant *legally* have the water test applied without the consent of the owner or the Local Authority, and then try to make them pay for the cost of a new drain?"

Answer.—(1) The Local Authority are in nowise liable in respect to any expenses incurred in relaying drains consequent on their officers having issued a certificate that the house was fit for occupation. The tenant could not succeed in an action against the Authority or its officers. The latter were not employed by the tenant, but by the Authority, and a certificate given under the building bye-laws is not a warranty. The idea that a Local Authority can be successfully sued under such circumstances is absurd. (2) Yes. The tenant has an absolute right to test the drains without seeking the consent either of the owner or the Local Authority.

2170.—Sanitation: Slides for Illustrating Lectures on.—"Nemo" writes:—"Some time ago I noticed in your valuable paper an account of a lecture on 'Sanitation' illustrated by lantern slides. As I have been asked to give a descriptive lecture on the same subject, could you kindly refer me to some good lectures, also some good jokes connected with the subject, informing me where I may obtain lantern slides, and what are the objects of same?"

Answer.—Lantern slides, diagrams, and models for lectures and teachers on hygiene are obtainable from the Sanitary Institute, Parkes Museum, Regent-street, London, W., and also from the Hygienic Referendum, 12, Ferrestone-road, Hornsey, London, N., from whom catalogues of slides, &c., may be obtained. We do not know of any lectures printed and published for sale suitable to the requirements of a lecture. Mr. John Lamb, Sanitary Inspector, Morecambe, recently gave a public lecture on Sanitation, which was appreciatively noticed by the local Press and referred to in our columns. Perhaps Mr. Lamb might on application send the querist a copy of the local newspaper containing the report of his lecture if the querist encloses 2d. in stamps.

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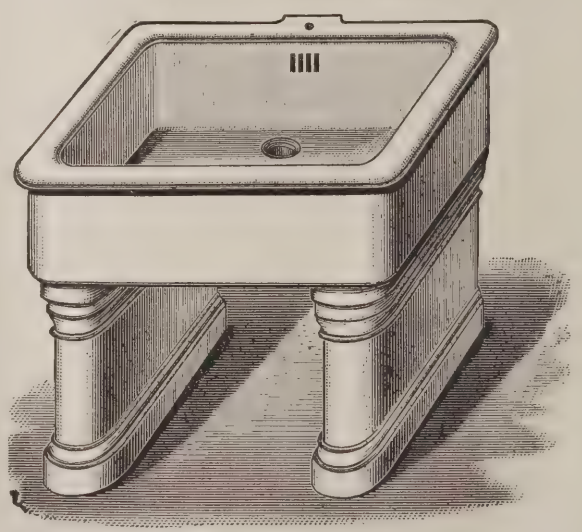

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NUISANCES AND METHODS OF INSPECTION.[1]

By J. Spottiswoode Cameron, M.B., B.Sc., M.O.H. Leeds.

NUISANCES AND INSANITARY CONDITIONS.

"Nusance, *nocumentum*, or annoyance," said Blackstone[2] upward of a hundred years ago, "signifies anything which worketh hurt, inconvenience, or damage. And nusances are of two kinds; *public* or *common* nusances, which affect the public, and are an annoyance to *all* the king's subjects; for which reason we must refer them to the class of public wrongs, or crimes and misdemesnors: and private nusances," which the writer defines as "anything done to the hurt or annoyance of the lands tenements or hereditaments of another."

"If a man builds a house," says the same writer, "so close to mine that his roof overhangs my roof, and throws the water off his roof on to mine, this is a nusance, for which an action will lie. Likewise to erect a house or other building so near to mine, that it obstructs my antient lights and windows is a nusance of a similar nature. But in this latter case it is necessary that the windows be *antient*; that is, have subsisted there a long time without interruption; otherwise there is no injury done. For he hath as much right to build a new edifice upon his ground, as I have upon mine: since every man may erect what he pleases upon the upright or perpendicular of his own soil, so as not to prejudice what has long been enjoyed by another; and it was my folly to build so near another's ground. Also, if a person keeps his hogs, or other noisome animals, so near the house of another, that the stench of them incommodes him and makes the air unwholesome, this is an injurious nusance, as it tends to deprive him of the use and benefit of his house. A like injury is, if one's neighbour sets up and exercises any offensive trade; as a tanner's, a tallow-chandler's, or the like; for though these are lawful and necessary trades, yet they should be exercised in remote places; for the rule is '*sic utere tuo, ut alienum non laedas*:'[3] this is therefore an actionable nusance. So that the nusances which affect a man's dwelling may be reduced to these three: (1) Overhanging it: which is also a species of trespass, for '*cujus est solum ejus est usque ad coelum*:'[4] (2) Stopping antient lights: and (3) Corrupting the air with noisome smells: for light and air are two indispensable requisites to every dwelling. But depriving one of a mere matter of pleasure, as of a fine prospect, by building a wall, or the like; this, as it abridges nothing really convenient or necessary, is no injury to the sufferer, and is therefore not an actionable nusance."

Again the same author: "If one erects a smelting house for lead so near the land of another, that the vapour and smoke kills his corn and grass, and damages his cattle therein, this is held to be a nusance. And by consequence it follows, that if one does any other act, in itself lawful, which yet being done in that place necessarily tends to the damage of another's property, it is a nusance: for it is incumbent on him to find some other place to do that act, where it will be less offensive. So also, if my neighbour ought to scour a ditch, and does not, whereby my land is overflowed, this is an actionable nusance."

Again according to Sir William: "It is a nusance to stop or divert water that uses to run to another's meadow or mill; to corrupt or poison a water-course, by erecting a dye-house or a lime-pit for the use of trade, in the upper part of the stream; or in short to do any act therein, that in its consequences must necessarily tend to the prejudice of one's neighbour. So closely does the law of England enforce that excellent rule of gospel-morality, of 'doing to others, as we would they should unto ourselves.'"

The foregoing belong chiefly to the class of private wrongs, and as Blackstone points out, "the law gives no private remedy for anything but a private wrong" ("Com.," III. 13, II.). But nuisances are evidently of two kinds, public and private, the remedy for the latter being by action against the wrong-doer on the part of the person injured; the remedy for the former being until lately by "indictment only," except in cases such as where, a ditch having been dug across a public way, and a common nuisance having been thereby caused, the man whose horse is lamed by falling into it has a right of private action against the offender.

Common nuisances, as defined by Blackstone[5], "are a species of offences against the public order and œconomical regimen of the state; being either the doing of a thing to the annoyance of all the King's subjects, or the neglecting to do a thing which the common good requires. . . . Common nusances are such inconvenient or troublesome offences, as annoy the whole community in general, and not merely some particular person; and therefore are indictable only, and not actionable; as it would be unreasonable to multiply suits, by giving every man a separate right of action for what damnifies him in common only with the rest of his fellow-subjects. Of this nature are: (1) Annoyances in *highways*, *bridges*, and public *rivers* by rendering the same inconvenient or dangerous to pass: either positively, by actual obstructions; or negatively, by want of reparations. . . . (2) All those kinds of nusances (such as offensive trades and manufactures), which when injurious to the private man are actionable, are, when detrimental to the public, punishable by public prosecution, and subject to fine according to the quantity of the misdemesnor; and particularly the keeping of hogs in any city or market town is indictable as a public nusance. (3) All disorderly *inns* or *alehouses*. . . . (4) By statute 10 and 11 W. III. c. 17, all *lotteries* are declared to be public nusances. . . . (5) The making and selling of *fire-works* and *squibs*, or throwing them about in any street, is on account of the danger that may ensue to any thatched or timber buildings, declared to be a common nusance, by statute 9 and 10 W. III. c. 7, and therefore punishable by fine. . . . (6) Eaves-droppers, or such as listen under walls or windows or the eaves of a house, to hearken after discourse, and thereupon to form slander and mischievous tales, are a common nusance and presentable at the court-leet or are indictable at the sessions and punishable by fines and finding securities for their good behaviour. (7) Lastly, a *common scold*, *communis rixatrix* (for our law-latin confines it to the feminine gender), is a common nusance to her neighbourhood. For which offence she may be indicted; and, if convicted, shall be sentenced to be placed in a certain engine of correction called the trebucket, castigatory, or *cucking* stool, which in the Saxon language is said to signify the scolding stool; though now it is frequently corrupted into *ducking* stool, because the residue of the judgement is, that, when she is so placed therein, she shall be plunged in the water for her punishment."

I need scarcely remind you that the preferring of an indictment of this last kind does not come within the province of the Nuisance Inspector appointed under the Public Health Act, 1875. The law of nuisance, however, is practically the same as in the time of Blackstone; but to enable it to be more readily brought into

[1] A lecture delivered in the Philosophical Hall, Leeds, April 18th, 1901.

[2] "Commentaries," III., 13. I quote the spelling and punctuation from the ninth edition, published in 1783.

[3] "So use your own that you injure not another."

[4] "Whose the soil is, his it is even to the sky.

[5] "Com.," I. 13, II. 8.)

action, recent legislation—nearly all of it dating from the middle of the present century—has established a mode of procedure by which certain common nuisances can be dealt with in a summary manner by the inferior courts. Since 1848 a series of statutes have placed it within the power of Local Authorities to take proceedings against offenders causing annoyance or injury by certain classes of nuisances, and it is the duty of the Sanitary Inspector to ascertain the existence of nuisances of this class, and to bring that existence under the notice of the Sanitary Authority.

We have seen that the legal definition of a nuisance defined by Blackstone is a very much larger one than the practical nuisance with which the Sanitary Inspector has to deal. The question of ancient lights, unless their obstruction renders the house unwholesome, would not come within his cognisance. The freeing of highways from obstructions, the suppression of disorderly alehouses, or the regulation of the sale of fireworks, the prevention of eavesdropping, and the punishment of common scolds, do not come within the province of either the rural or urban Nuisance Inspector. He is really a health officer; he is one of the skirmishers of the great "preventive medicine army" engaged in pushing forward the attack upon disease into the enemy's country, in cutting off the supplies, and demolishing the outworks of pestilence and plague.

The special nuisances with which he has to deal are those which are dangerous or injurious to the health of the community. In the 91st section of the Public Health Act, 1875, seven groups of nuisances are described, which for the purposes of that Act shall be deemed to be nuisances, and liable to be dealt with summarily in the manner therein provided. In six out of the seven of these groups the words "injurious to health" occur. In the first four the words "a nuisance or injurious to health" are found. In the fifth the words "dangerous or injurious" occur, and in the sixth one part of the clause has the words "nuisance or injurious to health," and another part "dangerous or injurious to health," while the seventh sub-section leaves the health question entirely out of the definition. It is evident, therefore, that every nuisance does not need to be proved to be injurious nor even dangerous to health.

This 91st section is so important that I would impress upon all the necessity of committing its words to memory, and I venture to suggest a convenient method of remembering the order in which its sub-sections occur.

The first three of these I keep in mind by remembering the letter "p," and I repeat to myself the words "premises, pools, pigs," not as Mrs. General, the governess in "Little Dorritt," repeated the magic words, "Papa, potatoes, poultry, prunes, and prism," for the sake of making the mouth look pretty, but merely as an aid to memory. "Premises, pools, pigs," remind me that the first sub-section deals with "any premises in such a state as to be a nuisance or injurious to health," in which short phrase might be supposed to be contained, from a sanitary view point, almost all "the law and the prophets." The second sub-section, which I memorise under the word "pools," describes as a nuisance which may be dealt with summarily "any pool, ditch, gutter, watercourse, privy, urinal, cesspool, drain, or ashpit, so foul or in such a state as to be a nuisance or injurious to health." The third sub-section, which, for the sake of alliteration, I remember by the word "pigs," runs as follows:—"Any animal so kept as to be a nuisance or injurious to health."

The fourth and fifth sub-sections I associate with the letter "c," taking the liberty of striking off the first syllable of "ac-cumulation" and the first two syllables of "over-crowded" for that purpose. The sub-sections are thus remembered as "'cumulation," "'crowding." They run as follows:—The fourth, "any accumulation or deposit which is a nuisance or injurious to health;" and the fifth, "any house or part of a house so overcrowded as to be dangerous or injurious to the health of the inmates, whether or not members of the same family."

As already said, the three "p's" and the first "c" require to be nuisances or injurious to health; the second "c," "the house or part of a house overcrowded," need only be so far overcrowded as to be "dangerous or injurious," the proof of actual injury not being therefore necessary.

The sixth and seventh sub-sections I associate with the letter "f," "factories" and "furnaces." The sixth sub-section runs as follows:—"Any factory, workshop, or workplace (not already under the operation of any general Act for the regulation of factories or bakehouses) not kept in a cleanly state, or not ventilated in such a manner as to render harmless, as far as practicable, any gases, vapours, dust, or other impurities generated in the course of the work carried on therein that are a nuisance or injurious to health, or so overcrowded while work is carried on as to be dangerous or injurious to the health of those employed therein." Here, again, the vapours and dust may be a "nuisance or injurious to health, and the overcrowding dangerous or injurious to health." In the seventh sub-section (the furnaces), injuriousness to health is not a necessary part of the offence. The sub-section runs: "Any fireplace or furnace which does not, as far as practicable, consume the smoke arising from the combustible used therein, and which is used for working engines by steam, or in any mill, factory, dyehouse, brewery, bakehouse, or gaswork, or in any manufacturing or trade process whatsoever; and

"Any chimney (not being the chimney of a private dwelling-house) sending forth black smoke in such quantity as to be a nuisance, shall be deemed to be nuisances liable to be dealt with summarily in manner provided by this Act."

To these general clauses there are two provisoes. In the first place, an accumulation or deposit not kept longer than is necessary for the purposes of business or manufacture, and as to which the best available means have been taken for preventing injury to the public health, may escape without a penalty if these facts are proved to the satisfaction of the Court; and, secondarily, in respect to a fireplace or furnace not consuming its own smoke, the Court shall hold that no nuisance is created within the meaning of the Act if it be satisfied that "such fireplace or furnace is constructed in such manner as to consume, as far as practicable, having regard to the nature of the manufacture or trade, all smoke arising therefrom, and that such fireplace or furnace has been carefully attended to by the person having the charge thereof."[6] But even this apparent exception of the seventh sub-section is not really an exception to the general principle that the Act deals with the public health, for it is tacitly understood that smoke is a nuisance injurious to the health of the community, a matter about which I suppose there can be not the "faintest shadow of a doubt."

The corresponding section of the Public Health (London) Act, 1891, has some slight variations from the wording of section 91, 1875. It is the second section of the Act. In the "premises" sub-section, the words "or dangerous" are inserted after "injurious."

In the "pools" sub-section, after the word "watercourse," the words "cistern, water-closet, earth-closet," are inserted, and after the word "drain" the word "dung-pit" is added. The words "or dangerous" are also inserted after "injurious," as in the earlier sub-section.

In the "pigs" sub-section, the word "dangerous' is

6 Further exemptions are made as to smoke in Section 334.

also inserted, and instead of "so kept," the words are "kept in such place or manner."

In the "'cumulation" sub-section the word "dangerous" again appears along with "injurious," and in the "'crowding" sub-section the two words "dangerous or injurious" are altered in their order so as to read "injurious or dangerous," as in the earlier sections.

A separate clause in the London Act contains an enactment about water fittings.

The "factory" sub-section is remodelled altogether, though the meaning is not much changed, and two sub-sections (23 and 24) are given to the subject of smoke prevention.

(To be continued.)

THE SANITARY INSTITUTE.

SEWAGE PURIFICATION AND STANDARDS OF PURITY.

A SESSIONAL meeting of the members of the Sanitary Institute was held on Wednesday, the 17th inst., at the Parkes Museum, Margaret-street, W. Dr. A. Wynter Blyth, M.R.C.S., the Medical Officer of Health for Marylebone, presided, and there was a large attendance.

A discussion on "Sewage Purification and Standards of Purity" was opened by Dr. H. R. KENWOOD, M.B.F.C.S., Assistant Professor of Public Health, University College, and Dr. W. BUTLER, M.B., C.M., the paper being read by the first-named author. They said that the desirability of generally adopting the biological method of sewage purification must depend upon the favourable verdict not of one but of all. The subject was complex, and our knowledge of it still very imperfect. The facts which the work of the past few years appeared to substantiate could be summarised as follows:—(*a*) The biological purification of sewage is not only the most rational but also the most effective method of sewage disposal, and although exaggerated notions as to the economy of the method are very prevalent, it is doubtless cheaper than artificial means of purification; (*b*) that biological purification disposes in a large measure of the sludge difficulty; (*c*) that double contact beds (in which sewage is locked up in the bed) give excellent results with partially sedimented sewage or septic effluent; (*d*) that such contact beds may be worked with satisfactory results when their depth amounts to 12ft.; (*e*) that contact beds 3ft. deep can be worked at the rate of 500,000 gallons per acre in eight-hour cycles (one hour to fill, a rest of two hours, one hour to empty, and four hours rest) per diem as recommended by the Local Government Board; (*f*) that intermittent filtration of sedimented sewage through beds, the outlet pieces of which are constantly open, has given excellent results; (*g*) that the material for the construction of bacterial beds is not of prime importance, so long as the particles are not too fine or too large, and that the best size for the particles probably ranges from about one to two inches; (*h*) that it is very difficult indeed to maintain the capacity of the bed, but the more complete the sedimentation of the sewage the less the holding capacity of the bed is affected; (*i*) different sewages resist the natural agencies of purification very differently, and, therefore, it is not safe to dogmatise that, because one installation gives satisfactory results with a certain sewage, that it will furnish equally satisfactory results with a similar bulk of another sewage; (*j*) that bacterial beds increase in efficiency with use, and some time must elapse before they exert their maximum amount of purification; (*k*) that there is no material difference from the point of view of subsequent purification in the effluents from a closed (septic) tank and a scum tank. It might be disputed whether aërobic or anaërobic conditions are the more favourable for the liquefaction of the organic matter in suspension, and for reducing the stability of the more stable organic matter, but it might be taken for granted that circumstances favouring high oxygenation promote the ultimate changes of purification and the production of an effluent with good physical characters, incapable of putrefaction and developing odour. This condition of things was sought to be conserved in all installations. They attached so much importance to the continuous aëration of the effluent, that in their opinion every effluent drain should be discharged into a shallow open conduit where possible. The distribution of the sewage evenly over a bed is of great importance, even after the sewage has been robbed of the bulk of its suspended matter. The method of applying crude sewage by a single carrier to a coarse continuous contact bed must have the effect of overtaxing the bed on either side of the trough, and such a filter would not be given the best chance of carrying on its work. While it was an open question how far the disintegration, liquefaction, and decomposition of sludge is hastened by maintaining it under strictly anaërobic as against aërobic conditions, it did not appear that there is any gain by keeping the liquid sewage free from contact with the air. Sewage hastens to its ultimate goal of inoffensiveness by the oxidation of its polluting matter, undeterred, and indeed favoured by the fact that from the outfall it is fully exposed to the air. Sewage exhibits a remarkable tendency to aërobic purification, and this is so whether aërobic conditions are favoured or merely permitted. Experiments disclosed instances in which nitrification proceeds at the same rate in the same sewages and effluents under such dissimilar conditions as free exposure in shallow open vessels to the air, and so enclosed in stoppered bottles that there are only a few cubic centimetres of stagnant air above the surface of the liquid. When some of the conditions under which these changes were found to occur were reproduced on a large scale the same results were to be observed. The effluents furnished by similar sewages from a scum tank and a closed septic tank were very similar to each other. The scum provided a cheap roof which preserved the heat in the sewage and promoted bacteriolysis. The advantages of tanks could be summarised as follows: they promote uniformity of effluent, they permit of the digestion of from 30 to 40 per cent. of the solids, while the suspended solids in the effluent were found to amount to only from ten to thirty parts per 100,000, the stability of most of the organic solids is rapidly reduced by a short sojourn in a tank, and subsequent purification facilitated. The sedimentation and liquefaction tank, either open or closed, would almost certainly figure largely in the future, owing to the simplicity of adapting such a method to existing plant, and the less expensive open tank would generally be preferred to the closed tank. An important thing to note, as bearing most directly upon the practicability of a more rapid sedimentation in practice, is the circumstance that when it is necessary to remove the deposited sludge this might be done with but little offence, and when it is applied to land it soon becomes resolved, and no nuisance is appreciated in the immediate neighbourhood. Rapid sedimentation, therefore, appeared to be eminently practicable; and this, followed by the application of the effluent to primary and secondary bacterial beds treated by intermittent contact, with outlet pipes constantly open and fed by sprinklers or Stoddart's distributor, appeared to afford the best means at present known of dealing efficiently with sewage in the shortest time and on the smallest area. Generally speaking, land was becoming too valuable to be put to the purposes of sewage purification, hence the modern endeavour to reproduce all the most

favourable conditions of land and to concentrate them in a small area known as a bacterial bed, but where land suitable in nature and quantity could be procured equally good results are obtainable. A thousand gallons per square yard per 24 hours could often be purified by such beds, and 500 easily; very high figures of oxidised nitrogen were obtained, frequently reading from four to six parts per 100,000, and they had found dissolved oxygen amounting to about seven milligrams per litre. A large proportion of the total nitrogen of the sewage was oxidised nitrate, and the free ammonia might be almost nil. Multiple beds were important for the more rapid completion of a purifying process, the initial stages of which might not be disclosed in the ordinary form of an analysis; by the use of secondary beds a much greater degree of purification could be obtained in a shorter time than by means of primary beds alone. Whilst the discharge of most trade effluents into the general volume of sewage is not attended with any drawbacks, no trade discharges should be allowed which prejudicially affect the treatment of the bulk of the sewage; these should be collected and treated separately. Dealing with the question of the standards of purification, the authors said there was great need of system in the collection of samples, the methods employed for analysis, and the construction of standards. The work of a biological installation was not always manifest in the terms of chemical analysis, and those who had experience of the varying characters of sewage, and even of effluents, would attach a qualified importance to a chemical report expressed in terms of a percentage purification of sewage calculated from the albuminoid ammonia or oxygen absorbed figures. The authors showed the rapid changes which might take place in even a finished effluent, and therefore their observations had been extended over long periods and with many varieties of sewage, but the results were puzzling. For instance, nitrates would increase with amazing rapidity in an effluent, and would with equal astonishing quickness decline. What is needed, undoubtedly is an inclusive estimation of the organic matter still in solution in an effluent, and until that was obtained it was impossible to lay down a hard-and-fast chemical standard applicable to all cases. High nitrates had always been considered desirable in an effluent, but their observations showed that nitrates might be high at one time, and at a later period become enormously reduced. No particular figure could be fixed upon as a standard of oxidised nitrogen. The presence of nitrates in an effluent must not be regarded as a sure index of purification, but if they were found to persist in an inoffensive effluent for a few days after collection, the effluent was not likely to become offensive. One of the best tests for a satisfactory effluent was to see if nitrates are present after incubation at 80 deg. Fah. for forty-eight hours, and if they are it would remain inoffensive, no matter whether the original albuminoid ammonia was ·05 or ·5 parts per 100,000. They were not much disposed to attach importance to the question of effluents containing specific organisms, but the point was one upon which some scientific data would be interesting and valuable.

A long discussion followed, Major-General C. P. Carey, R.E., Mr. W. Scott-Moncrieff, Dr. S. Rideal, Dr. Barwise, Mr. E. G. Parry, the Chairman, and others taking part. A hearty vote of thanks was accorded to Drs. Kenwood and Butler for their valuable paper.

Lovers of the picturesque lament the gradual elimination of thatch for rural cottages and the substitution of slate and tile roofing. But there is something else besides picturesqueness to think about, and the serious fires which have occurred in thatched-roofed villages is at least one reason to be urged in favour of slate and tile.

BUILDING TRADES EXHIBITION.

The fourth biennial Exhibition of the series under the control of Mr. H. Greville Montgomery was opened at the Royal Agricultural Hall, London, on April 17th. There was no formal opening as in previous years, on account of the absence of Lord Wolseley abroad.

The extensive display of necessaries for architects, builders, sanitarians, health officers, and others was exceedingly representative, and Mr. Montgomery's arrangements admirable. Bricks and tiles, pipes and sanitary ware, stones and marbles, glass and pavement lights, carpenters' fittings and builders' sundries, engines and electric wiring, felts, plasters, cements, and non-inflammable fabrics were all on exhibition. The special exhibit by the proprietors of the *Surveyor* was held in the gallery; the smoke abatement section in King Edward's Hall; and the fire prevention section in the Minor Hall. Members of the Institute of Builders and Architectural Association visited the Hall on Friday and Saturday; and subsequently the Institute of Sanitary Engineers and Society of Architects appeared upon the scene. The conference on "The Standardising of Bricks" was fairly well attended.

But we must now indicate the features of the Exhibition for the benefit of readers who were unable to be present. Palmers' travelling cradle is a noteworthy adjunct, whether in a hall or in actual work on Southwark Bridge. Happily, these patent wire-supported travelling cradles are now in vogue, and the London County Council and Corporation Authorities, as well as builders, use them for painting, plumbing, pointing, and stonework. The cradle or boat is raised or lowered by means of ordinary tackle, the head blocks of which run along a wire cable, and, by aid of guy blocks and lines, carries it to any part of the structure being operated by the men in the cradle. The travelling cradle (also the scaffold for interior and ceiling work) have only to be seen to be admired for their utility and facility of adjustment.

Messrs. Joseph Place and Sons, of Darwen, hold the patents for the "Adi" and "Zaza" chimney tops; and we could detect them aloft as we approached. But those overhead had been sold. On the stand were displayed the patent yard gully, which is so much in vogue, and a specimen of their horse manger. There were also end milled bricks in many colours, and salt-glazed bricks of varied utility. The firm had forward a few specimens of the sanitary tubes and stoneware pipes for which they are famed, including Ewings excentric pipe for grouting in waterclogged ground. Messrs. Place and Sons were awarded four gold medals and two silver ones for their sanitary tubes during 1898-99; and the weekly output at Darwen is about fifteen miles per week in sizes from 2in. to 42in. diameter. Several of the patent chequer bricks were also shown, and altogether the display was highly creditable.

Stanley Brothers (Nuneaton) were again to the fore. The space occupied covers 10ft. more than at previous shows, and on this occasion their wares were set off to the best advantage. The office is about 10ft. high, 10ft. long, and 8ft. wide, and is built up outside of bricks of all colours, such as white, blue, granite, buff, ivory, green, yellow, and chocolate. The roof was covered with red roofing tiles, with ridge; and in front over the doorway were a number of vases in which were evergreens, and here and there glazed socket pipes and connections, and red and buff chimney pots. The stand in line was built up pyramidal fashion from the sides, and thereon were terra-cotta ventilators, finials, ridge tiles, ornamental red and buff terra-cotta vases, blue Staffordshire ware, glazed coping to receive fencing, glazed sanitary pipes and connections, &c. There was a medallion of Queen Elizabeth in teapot ware of dark-brown glaze, and two of the late Queen Victoria in buff

and red terra-cotta. In the centre was the face of the Queen, and across "Empress of India," with the words Canada, Australia, New Zealand, Burmah, Africa, Egypt, Gibraltar, Malta, Cyprus, inserted, making a pleasing memorial. Over the top was 1837—1901, and the Royal Arms, with the rose, thistle, and shamrock. It was a fine and artistic display.

Messrs. Ham, Baker, and Co., of Westminster, had a capital show in the gallery, and they made the most of it. There were stand-pipes, hydrants, drilling apparatus for tapping a pipe under pressure, a capital hand pump for contractors, and water-service fittings. Of course, their patent instantaneous penstock, a non-flooding valve, was in the forefront, and it is very useful for basements where it is necessary to prevent a back flow of sewage, and also for bacterial beds. We also noticed the "Bee" water meter, a swivelling hose-cradle, and the waste-preventing post for courtyards, which is so worked that only a limited quantity of water passes out. Indeed, specimens of all the well known specialities of the firm were displayed.

The Albion Clay Company were in the hall as usual, but on this occasion the exhibits were in the gallery and not in the main hall. The show in the bay is very fine, and specimens of the pipes and the connections for which this firm have a great reputation in the sanitary world were set out. It is thoroughly representative, including Sykes' conduit for electric cables, stoneware, drain, and sewer pipes, and Sykes' patent street gulley, for which the firm received the medal of the Institute in 1899. As is well known to our readers, this gulley is made in granitic stoneware to resist great pressure, and is easy of access for cleansing through screw-plugged inspection eye. The bay was fully occupied, but not too crowded, with their specialities.

Mr. W. F. Stanley (of Holborn) has a grand display of mathematical and surveying instruments, which attracted considerable attention. Theodolites, surveying chains, levels, drawing instruments, &c., were nicely arranged in show-cases; but the chief attraction was the exhibition of a printing frame for sun photographs.

The Septic Tank Syndicate illustrate their system with photographs of works carried out under their patents—namely, at Exeter, Yeovil, and Barrhead, near Glasgow. The photographs enable sanitarians to follow the application of the system in towns and villages.

Jennings and sanitary engineering are interchangeable terms, and any builders' show without George Jennings (of Lambeth) would be incomplete. The space is well arranged, and the model bathroom *de luxe* in the style of Louis XIII. is artistically set out. It comprises spray bath in enamelled copper with valves for douches, and mahogany enclosure; cabinet lavatory in Bouge de Verone marble and mahogany enclosure; shampooing valves, cupboard pattern mirror; bidet and footbath, inside lavatory; concealed water-closet without base and with mahogany armchair seat, one of which has been sold to the King. Then there are club, fold-up, cabinet, and new model lavatories; spray, porcelain, and cast iron baths; sinks, and many other sanitary devices, for the Lambeth Works are famed far and near. George Jennings was entrusted with the sanitary arrangements of the foreign residences of the late Queen Victoria, and the firm still maintain their high position as sanitary engineers both at home and abroad.

Mr. Edward Allcott has an effective show of his "red gum" wood for street paving purposes, which is now attracting the attention of municipal and sanitary authorities. The floor of the bay is paved with "red gum" in "herring-bone" style, and proves a veritable object-lesson to all and sundry. Wood paving has taken the place of the older methods in large towns, and "red gum" is now used in Brighton and London, and is about to be used in Southall, Ealing, and Hanwell. This paving has to compete with many rivals, but, being non-porous, it is practically a sanitary paving. Mr. Allcott declares it to be durable, non-slippery, noiseless, and easily cleaned.

Specimens of the manufactures of the Ames-Crosta Sanitary Engineering Company, of Nottingham, are shown to great advantage in the bay they occupy in the gallery. The firm are well known for the excellence of material of their manufactures, and it is only possible to indicate their various specialities. We noticed the surface-water gully for which they received two medals from the Institute, and also the self-adjusting pipe joint, which, it is claimed, is sound, gas and water-tight. The company now make improved "ways" for electric cables of stoneware. At first sight these "ways" seem to be ordinary drain pipes, but on inspection of the inside it may be noticed that there are several "ducts" for cable ways. In jointing the "ways," the same operation is followed as in the drain pipe, but the "withs" which form the divisions do not abut against each other at the ends when the "ways" are laid. The improved form of cable-way is to preserve a perfectly dry "duct." If moisture finds its way into the pipe it would fall to the lower "way" and would be carried off to the "drawing-in" box. Indeed, the aim of the company is to maintain a thoroughly dry duct for the cable.

Messrs. J. Defries and Sons, of Houndsditch, have a small but interesting show in the gallery. There we recognised the famous Pasteur-Chamberland filter, and a number of smaller filters for home use. But possibly municipal authorities and engineers were interested in the Equifex disinfection stove, and the Equifex sewage tank, with a disinfectant exhaust; at all events they got to know all about these specialities.

The Adams' Patent Sewage Lift Company, of London and York, appeal to engineers to examine their syphons. While the apparatus is well known to our readers, the photographs enable engineers to follow the operations of the Adams' system from start to finish. Several forms of automatic sewage lifts are exhibited, and the lifts are shown to be operated by clean water or sewage.

(To be continued.)

INCORPORATED SOCIETY OF MEDICAL OFFICERS OF HEALTH.

BRANCH MEETING AT PLYMOUTH.

Members of the West of England and South Wales Branch of the Incorporated Society of Medical Officers of Health met for the first time at Plymouth on Thursday last. The chair was taken by Dr. Herbert Jones, of Herefordshire (President of the branch), and Dr. F. M. Williams, Medical Officer of Health, of Plymouth, introduced a discussion on "Plague Precautions in Ports." He pointed out that the disease was now pandemic, practically to be met with the whole world over, the infected districts being generally the terminal points for vessels from originally infected ports. It was now admitted that rats were the prime factors in the spread of disease. It was held at one time that plague went along the lines of trade communication, where people went, but that was not necessarily so. Generally, it was found the animals carried it, not the people. His chief point was that no regulations were issued by the Authorities giving power to deal with baggage and cargo on infected vessels, and therein lay a weakness of the system. No suggestion seemed to have been made as to dealing with the importation of rats on such vessels. He was of opinion that some united action was required, and that most stringent regulations should be framed and adhered to in dealing with rats on infected vessels. But a weaker point, and one which, he thought, should be suggested to the Local Government Board, concerned passengers' baggage. A man came, say, from Bombay, who had been living there some

time. At the present moment natives were dying there at the rate of a thousand a week of plague. With the gentleman travelling came a native servant, who might be infected, or who might have been about in the bazaars or anywhere, yet the baggage was in no sense dealt with unless the traveller was known to be an infected person, or the ship was known to be infected. The examination of passengers and crew at present was not sufficient; they should really be stripped, and their temperatures taken, &c., but that would mean a delay of three days, perhaps, and the detention of the vessel. The French did that sort of thing at Suez, but our authorities had no such system. The precautions adopted at Plymouth—nearly every port had its own system—were mainly medical inspection. Outside troopships there would be about sixteen mail boats from infected ports calling at Plymouth each month, and the crews numbered from 100 to 300. If a vessel was certified not infected, all sick cases were satisfactorily examined, and the usual declaration was made by the surgeon to the Customs, the ship was passed. Yet there was a possibility then of a case escaping them, as was so in regard to the Simla recently. Local Authorities had full power to deal with infected soldiers coming home in transports, and the War-office had placed Drake's Island at their disposal, as well as agreed to meet the cost of treatment. With reference to the rats in the town, the Dock Authorities had been notified to give any information in reference to any undue mortality, as they had a good many sailing ships from infected districts discharging grain. Up to the present no action had been taken by the Dock authorities in dealing with the vessels as they were tied up to the quay, as to lifting gangways at night, as to their hawsers, or as to preventors: he was trying to get them to do so. In the town they had made arrangements for the immediate removal of cases either by day or night. He was sorry they had no crematorium, and any bodies of cases who died in the town would have to be buried, but they had made every arrangement even to having large graves, which would be capable of taking a ton of quicklime. Local pilots had notices dealing with plague, cholera, and infectious diseases. There was no list, and none had ever, he believed, been published by the Local Government Board as to infected ports, and they had to glean by newspaper reports which ports were infected. The idea of the authorities seemed to be that any such list would interfere with trade. But it was a serious omission. There should be some arrangement whereby they could get accurate information. He was given to understand that Cape Town and other ports had been infected for months and months, only the matter had been kept quiet.

Dr. Heaven, Dr. J. T. Thomas, Dr. Alford, and the Chairman took part in the discussion, after which Dr. F. M. Martin (Stroud) opened a conversation on "Scarlet Fever and Milk," referring especially to an outbreak of scarlet fever in his district, which was due to milk, and which gave rise to the question as to how far infection could be started by a very mild case such as could hardly be detected. The boy to whom the doctor traced the source of outbreak had, when seen, no real symptoms of the disease. The suggestion was not that the skin spread the disease through the agency of the milk—the boy assisting to milk cows—but that by spitting on his hands, or something of that sort, he had caused the milk to be infected. When the boy was taken from the work the outbreak was readily checked.

In the discussion which followed Dr. Martin's views were endorsed, several of the gentlemen quoting cases which had come under their personal observation.

Dr. Williams remarked that it appeared to him the type of scarlatina had greatly changed of late years, the rash being often missed, and this view was generally shared by the medical gentlemen present.

Dr. Noy Scott invited an opinion as to the probability of bovine scarlet fever, and said the veterinaries he had questioned laughed at the whole thing.

The essayist said he was somewhat sceptical, but thought they must take the position stated by the Local Government Board.

A vote of thanks was passed to the Mayor for the use of the parlour, and the meeting closed.

THE INSTITUTE OF SANITARY ENGINEERS

(Incorporated).

OFFICIAL TRANSACTIONS.

The monthly sessional meeting was held on Wednesday, 10th April, Mr. E. R. Palmer, Vice-chairman of Council, presiding, when the following paper was read by Mr. Wm. Elgie Bland, F.I.S.E., A.S.I., of Newcastle-on-Tyne, Inspector of Technical Classes to Durham County Council, on

THE NEED OF UNIVERSAL EDUCATION ON SANITARY MATTERS.

Sanitary science has during the last twenty years made rapid strides, and the general improvement in the health of certain classes of the nation is very marked during that period.

I fear, however, that the experts have advanced so rapidly, that they have left the general public too far behind, for the latter are looking upon them as enthusiasts and faddists, and I am afraid will continue to do so, if we do not make every effort possible to carry them with us in sanitary knowledge, and convince them, (as we ourselves are convinced) of the great benefit the nation will derive by adopting up-to-date sanitary principles.

The value of sanitation is really a personal question, and until the people themselves thoroughly understand the importance of it, and bring the weight of their individual effort to bear on the question, very little real advance in this direction can be made.

I do not suggest that every man and woman should become sanitary experts, but that if we, as a nation, desire to live healthy and cheerful lives, the general public should have a better knowledge of Nature's sanitary laws than exists at present, and should put them into daily practice; and the important mission of educating the people to fully appreciate the advantages of sound sanitation does and should devolve largely upon such institutions as the one whose members I have the honour of addressing to-night.

Perhaps everyone does not admit that this world is a beautiful and pleasant place to live in; it is none the less a fact, and but for man's wilfulness and ignorance in acting contrary to Nature's laws, this fact would be apparent to all. Providence has practically given us the entire control of the bodies in which we live, and the laws we should follow to ensure the healthfulness of these bodies are after all simple, and should be generally understood by all. This being so, it is sad and very wrong to see a great amount of preventible disease and sickness that exists throughout the universe. I say preventible, because we have advanced far enough in sanitary science to know that if the public individually fully realised the value of sanitary knowledge, and would practise it, disease and sickness would be reduced to a minimum, if not practically stamped out altogether.

Surely, then, the subject of hygiene and sanitation should become one of the very first importance in the teaching of our schools; indeed, to my mind, quite as important as either reading, writing, or arithmetic. It is not rare, even in our days, to hear some people contend that disease and sickness are the result of natural causes, over which we have no control, thus blaming an all-wise Providence for what is undoubtedly the result of ignorance and carelessness. For my own part, I

cannot bring myself to believe that a Divine Power ever designed pain, sickness, or misery; to a thinking man everything suggests that our Maker intended man to be physically healthy and happy, and our troubles are simply the inevitable results of our wilfully and carelessly ignoring Nature's simple laws of sanitation.

When we hear the knocking of a faulty or badly-oiled engine, when we see leaks from drains, or corrosion of iron pipes or plates, we are warned that something has gone wrong with or about these things, which should be immediately put in order. So with ourselves, when we are visited by pain or sickness, it should be a warning to us that something has gone wrong with our organism or surroundings, which should be put right with as little delay as possible.

Acts of Parliament are undoubtedly necessary, and do assist sanitary progress by enforcing sanitary discipline, but they can do little towards a permanent cure or prevention, unless supported by the earnest co-operation of each individual; indeed, their success depends entirely upon the manner in which they are individually applied. For instance, the laws of our towns enact that every house shall be supplied with pure water, but they cannot compel each inhabitant to use it. They may stipulate that proper baths, wash-houses, and water-closets shall be provided, but they cannot make people use them. They may stipulate that our streets shall be wide, our windows large, and made to open so as to admit light, sunshine, and air; they cannot, however, prevent people from shutting out these life-giving elements by heavy blinds and curtains; and so I might go on. Therefore we are brought face to face with the fact that success depends solely upon the people being so educated in sanitary matters as to realise fully the enormous responsibility that rests upon them individually in such matters, not only with regard to their own health, but as to the well-being of those about them. This responsibility rests equally upon rich and poor; money will obtain most things in these days, but it cannot purchase perfect health, which God intended as a free gift to all.

It would appear, however, like many other free gifts, it is frequently not properly valued until lost. We are too apt to assume, especially those of us who are robust, that health is a fixed condition, and will care for itself, irrespective of its surroundings or of any unnatural strain we may put upon it, and that no effort is needed on our part to retain it.

Experience, however, very soon convinces us that such is not the case. Health is affected in very many ways; by our occupation and abode, the place we work in, the food and drink we take, the climate, water, drainage, personal cleanliness and general habits of life. All these and many others, as the Sanitary Engineer well knows, affect health, and the very thought and knowledge applied to the proper regulation of these influences for our benefit constitute true sanitation; for without experience and knowledge on sanitary matters we cannot properly regulate such influences.

You will generally find a healthy and happy family associated with good knowledge on sanitary matters, and, as a rule, those who are most careful about their own health are usually most thoughtful for that of their neighbours, and always assist (by their example, at least) in establishing healthy principles amongst the community at large. On the other hand, you usually find dirt and disease associated with ignorance and superstition.

We are told in the Bible that Moses included elementary sanitation in his religious teaching, and that the enforcing of sanitary regulations was part of the priests' and commanders' duties in those days. I would respectfully suggest that the religious preachers of our own time might also, with great advantage, take similar duties upon themselves, for godliness and cleanliness should go hand in hand, and the preacher, being so continually in touch with the people, could do much in the way of educating them in sanitary matters. Of course, it would be necessary that he should first qualify himself for such duties.

One wonders what Moses would have thought of a case that came under my notice some years ago, of the waste pipe from a baptismal font, in a church in the North, being directly connected with the top part of a town sewer, without any trap whatever; at which font hundreds of infants must have been christened with sewer gas as well as water, to say nothing of the atmospheric pollution of the church.

Though we may all agree as to the need of universal education on sanitary matters, the method by which it can be accomplished is not such an easy question to decide; indeed, it is most difficult. I frequently meet with the greatest opposition from seemingly intelligent and educated people, and have my suggestions denounced as absurd fads, which their forefathers managed to do without, and that the sole result of carrying them out would be to bring trouble and needless expense upon the already overburdened householder or landlord. It is no doubt the pocket, rather than the intellect, that dictates such expressions; at the same time, the sanitary profession is not entirely clear of faddists, who are responsible for much of the prejudice which exists; they are, however, the exception and not the rule, and are not likely to increase much as long as we have such institutions as this, to freely discuss and criticise in detail all new ideas, and expose them to the light of practical knowledge and common sense. To those sceptics and grumblers who state that sanitary science, as practised to-day, is unnecessarily faddy, I would suggest a careful comparison of the existing state of things with that of fifty years ago.

Take the dwellings of the middle and artisan classes, with their pure water supply, drainage system, and in many cases baths with a hot supply, and compare them with those of that period. Look at the medical statistics, and see how small-pox, typhoid, cholera, and scarlet fever when threatening to become epidemics are almost immediately stamped out, even in thickly populated districts. Indeed, it is not uncommon to find such districts in our large towns, where proper sanitary regulations exist and are carefully carried out by the people, showing a lower death-rate than country villages, where sanitary matters have never had proper consideration.

Then, again, compare the mortality of our workhouses, hospitals, barracks, and similar institutions to-day with that of the past, and see what sanitary science has done for their inhabitants. Look at the constant water supplies of our large towns and cities, and the careful and efficient manner in which subsoil drainage, sewage systems, &c., are generally dealt with. Are these the work of faddists, I would ask? I think not; they are the direct result of a broader and better knowledge of sanitary science, and their introduction has saved thousands of lives that would have been lost or made miserable under previous conditions. It proves that the advance in sanitation has considerably lengthened the average life of man, to say nothing of the healthier, happier, and more morally favourable conditions of his existence. And this in spite of the fact that his nervous system is subject to a much greater strain than was formerly the case. Between 1850 and 1900 the death-rate has been actually reduced from twenty-three to nineteen per thousand, chiefly on account of improvements in sanitary matters. Surely, then, when such results have been obtained in the face of opposition from a large portion of the population through ignorance of the advantages of reforms, it is fair to assume that, with this opposition removed by a

broader education and knowledge of sanitation, we should soon put an end to preventible disease.

(*To be concluded.*)

At a meeting of the Election Committee, held on the 10th instant, the following were elected as Associates:—S. L. Bartholomew, Clapham; C. E. S. Crawcour, Bray, Ireland; J. Moore, Whitley.

CORRESPONDENCE.

(*To the Editor of* The Sanitary Record.)

(*We do not in any way hold ourselves responsible for opinions expressed by our correspondents.*)

THE PLUMBERS' COMPANY AND THE REGISTRATION OF PLUMBERS.

Sir,—The letter of Messrs. Hunter and Haynes, solicitors to the promotors of the Plumbers' Bill, has just come under my notice, and I should be obliged if you would kindly give publicity to the remarks I have to make on the subject in your next issue. If the solicitors who are acting for the promotors of this Bill have to rush into print and try to defend the promoters' position, and ridicule Mr. Greenhall's paper, read before the Institute of Heating and Ventilating Engineers a few weeks ago, then so much the worse for the Bill and the cause of the promotors.

Without traversing the whole case, will the solicitors, in the absence of anyone better qualified than they, answer the following questions:—

(1) Is it not proposed by this Bill to make the plumbing trade a "close profession"?

(2) Is it not a fact that a trade or professional monopoly would be effected?

(3) Is the plumbing trade willing to act as the shoemaker, and "keep to his last" should this Bill become law?

(4) Is it not a fact that the plumbing trade have already, without an Act of Parliament, made certain inroads upon other trades, and allocated to themselves the right to do several kinds of work outside of the real plumbing business?

(5) Is it not a fact that the plumbing trade assert that it is their prerogative to instal all hot-water circulations, cold-water services, fire services, eaves, spouts, and down pipes, whether these be in lead or cast iron, or other metals?

(6) Is it not a fact that the plumbers (masters and operatives combined) elected to strike a job at Leicester because engineers were executing a hot-water service circulation?

(7) Is it not a fact that the same thing has happened in various other parts of England?

(8) Is it not a fact that the plumbers have taken under their special care besides plumbing work proper, *i.e.*, work executed in lead, such trades as the following:—Lead glazing, bells (crank and electric), spouting, electric lighting, speaking tubes, cold and hot-water services, painting and decorating, upholstering, awnings for weddings, carpet beating, linoleums and felts, sash lines and furniture repairs, and even undertaking?

(9) Is it not a fact that plumbers do a great deal of heating work, which rightly belongs to the heating engineer, but which the latter must not grumble about?

(10) Is it not a fact that in some towns where technical schools are established, the plumbers have denied the right to any individuals, other than those serving an apprenticeship (*sic*) to the plumbing trade, to attend the classes for the advancement of technical knowledge in this particular trade, although the schools are all supported by public funds?

(11) Is it a fact that should the plumbers secure the much desired Bill they are promoting, they will stop their aggressive attitude to other legitimate tradesmen, who follow a trade to which they have been apprenticed, and carry out their work in a legitimate and honourable way, particularly as regards engineers, who execute hot-water and cold-water services in metal pipes other than lead.

(12) Will the promoters of this Bill guarantee the Government or the public at large that, should the Bill become law (?), the rising generation of plumbers will be made perfect plumbers?

After stating these questions, I would like to ask if it is reasonable to suppose that Parliament would grant a Charter or an Act of Parliament to make a small handful of men proficient in their calling when they already have the facilities at their hands if they would only avail themselves of them. What is wanted is self-reliance, industry, application, and perseverance, not only for apprentices, but for operatives, old and young as well, to acquire that knowledge that best befits them to carry out that "good workmanship" in sanitary matters which should be incumbent upon any man who pretends to call himself a workman, and without invoking the aid of Parliament to do this for them.

More reciprocity of feeling should be considered by the plumbing trade, and they should let the "live and let live" principle predominate, rather than stimulate ideas which would form a hindrance instead of a progressive step in the beginning of the twentieth century. Public men and newspapers are all telling us just now of the great depression and commercial crisis that is impending in this country owing to foreign competition, and yet we have a City Guild who are apparently so ignorant of their own best interests as to push to extremes a policy that is fraught with the greatest danger to not only the plumbing trade of this country, but to allied trades. If the same energy, the same time and amount of money, spent in promoting this useless Bill were spent in educating the plumber and other allied tradesmen, technically, in the art of science and practical work, some good object would be achieved, and the future generations of both plumbers and public would benefit by it; but as it is at present a great waste is going on. The plumber is jubilant (sometimes defiant) over the possibility of this so-called Act; he has come to the conclusion that should this Act of Parliament only became a reality, the whole of his grievances are at an end, and he will have no more fields to conquer—in fact, the writer has been threatened already that when they (the plumbers) receive their Charter they will show what they intend to do.

Acts of Parliament will not make good plumbers any more than they will make great painters, authors, politicians, or engineers; great and good men must be made by their own conduct in life, the application and study they give to their respective businesses, and this, I think you will agree with me, is the only sure and true way to success. Combinations are useful so long as they are for the general good of the greatest number, but when combinations are made to create monopolies for the benefit of the smallest number, then they are fraught with the greatest possible danger, not only to the general public, but also to the monopoly so created, as their creation stultifies their end, and stops further development and progress.

In conclusion I would say that although my mind is "dead set" against the Bill, I shall not oppose the passing of it so long as the plumber only wants the Act of Parliament to cover legitimate plumbing work, and I think much of the present opposition would be removed if the Plumbers' Guild, or their mouthpiece who has thought fit to champion their cause, would give an undertaking, and circulate the same in all the principal trade journals and newspapers in the country, that it is

not the intention of the Plumbers' Registration Act to be aggressive and oppressive, but that the Act is for matters germane to what is recognised as plumbers' work, and that the plumbers will also reserve for the respective trades the same privileges they have enjoyed since they were apprenticed, viz.:—That engineers may erect any kind of water or other liquid installation, whether it be hot or cold, in any metal pipe other than lead. That ironmongers and other whitesmiths be allowed to carry on the work of their forefathers, so long as the men employed are specially trained for the work, but not by Act of Parliament. That electricians be allowed to fix electric bells and lighting as before. That lead lights and glazing be done by such trades as formerly. That painting and decorating be left to that trade. That undertaking, carpet beating, &c., be left to that class of tradesmen who follow these particular callings, and such like.

Lastly, let me state that there are several classes of water supply to our public buildings which have become specialities in the different trades. The exigencies of the present condition of things has brought this about and demanded it. What I ask is to allow these specialists who have made a constant study of this class of business for many, many years to proceed with the work entrusted to their care to instal, and for which they give a guarantee as to the efficiency and sufficiency of such supplies.

Speaking for the trade of which I have the honour to belong, I wish to say we have no desire to enforce prerogatives, nor do we insist upon a "close profession." If the plumber can do this class of work better than us, in course of time he will get the work instead of us, but I strongly object to a trade using means (not legally or morally right) to stop me and many more like me from pursuing a calling which I have followed as apprentice, journeyman, foreman, manager, and employer for a period of thirty-one years, during which time I have been engaged in executing some of the finest installations of the would-be prescribed class in this country.

I trust that you will be good enough to give the same publicity to this letter as you were kind enough to afford to Messrs. Hunter and Haynes, the solicitors to the promoters of the Bill, which, in my opinion, is a return to practices rampant in the dark and middle ages, when all kinds of abuses and excuses were made to increase the wealth of the already rich.

It is with the object of placing the matter fairly and squarely before your readers that I have ventured to trespass so much upon your space.—Yours faithfully,

London, W.C., FAIRPLAY.
April 20th, 1901.

THE RURAL HOUSING PROBLEM.

SIR,—Will you allow me most emphatically to endorse all that has been said by Mr. Geoffry Drage in his letter to you of the 11th inst?

As to the present deplorable condition of rural housing, I have in my possession ample proofs of the accuracy of those statements which persons who wish to hide the truth, or are unwilling to believe it, are so fond of setting aside as exaggerated. Undoubtedly there should be a Public Health Department with control of all matters pertaining to the public health, and it is to be regretted that there are so few medical men in the House of Commons to further the interests of the public in this direction. Control of the water supplies—so lamentably deficient and polluted in rural districts—should be in the hands of the County Councils, and not of the Rural District Councils.

I should also like to see a Public Prosecutor to take action on behalf of the people when they have suffered serious injury owing to insanitary arrangements which are also illegal. Hundreds die every year from diphtheria, enteric, diarrhœa, and other ailments, and many more suffer from permanent ill-health; and yet these victims and their friends have absolutely no redress, although the illnesses and deaths may have been clearly traced to the poisonous condition of the drainage and water supply, or to the dampness, draughtiness, and general dilapidation of the cottages. It is idle to say that the people need not live in such cottages. If they left them, they would oftener than not be homeless. Medical Officers have no independence of action, and many Inspectors of Nuisances are ignorant and unqualified. If they did their duty they would often be seriously overworked.

The building difficulty is only one part of the great question of rural housing. In a village in Cambridgeshire, with which I am well acquainted, there are at least twenty cottages with only one bedroom and one living-room, and others with two bedrooms in which the second room is so small that in cannot hold a bedstead, and the beds have to be made up on the floor. Many of the cottages are in a deplorable condition, and with bad sanitary arrangements. There is one pump with drinking water for the whole village (population 400), and the people have to fetch it from all distances up to 400 yards. The land and cottages are owned by about nineteen small owners, a college, and one large owner.

The chairman of the Parish Council is a farmer and small owner, and he also represents a neighbouring village on the Rural District Council. In conversation with some of the small owners, I have often expressed the wish that better cottages might be built in the village, and I have always received the same reply, "If good cottages were built no one would want ours, and that would be bad for us." Judging from these facts, it will be realised that Rural District Councils—as so often constituted in the country—do not always want to build even if they could afford it.

Persons who want to find an excuse for leaving matters alone, are fond of saying that if village slum property were condemned, it would tell hardly on widows who have no other means of subsistence.

As far as my experience goes, for every widow who lives on the profits of slum property, there are eight or ten others to whom such profits are not necessary. In the village in question, amongst the small owners are two widows, and the rest are prosperous or retired farmers, carpenter, bricklayer, retired servant, small holder, publican, insurance agent, and others. Several of these who had saved money, have, during the last few years, invested it in dilapidated cottage property as a paying investment. The Sanitary Inspector for this village is a publican and small farmer. Until the Public Health Acts are codified, and their administration placed upon a very much more satisfactory footing than at present, the cheapening of building, and the simplifying of the building laws—desirable as these reforms are—would not always result in the building of cottages in those villages which already possess a fairly sufficient number of the slum kind.—Yours, &c.,

C. COCHRANE (Mem. San. Inst.)
The Downs, St. Neots, April 15th.

THE Mayor of Bournemouth has received a communication from the Local Government Board intimating that it approves of the application of the Town Council to enlarge the borough boundaries by including Winton, Pokesdown, and Southbourne within the area. This will give Bournemouth an additional sea frontage of three or four miles, and will also include extensive pine woods belonging to Lord Leven and Melville, Viscount Portman, and the Shelley estate within the borough. It will also double the size of the borough area, and over thirteen thousand to the population, and extinguish two Urban District Councils and one Parish Council.

LAW CASES.

Failure to provide a Ventilating Shaft.

JOHN B. KYFFIN, a Borough Councillor of Hackney, was summoned to the North London Police-court, to remedy a defective soil-pipe at houses owned by him at Lauriston-road.

Mr. T. H. TIDDEMAN appeared for the Hackney Borough Council, and Mr. ELDRIDGE was counsel for the defendant.

The evidence of the Sanitary Inspector (Samuel Punter) and the Medical Officer (Dr. King Warry) was that there was a nuisance dangerous to health by the fact of there being no ventilating shaft to the sewer.

The contention for the defence was that the ordinary flushing apparatus was sufficient if properly used.

Medical corroboration was called on either side, but in the end

Mr. Fordham thought the proper safeguard was the ventilating shaft, and made an order for a supply of this to each of the houses in question, with £4 4s. costs against the defendant.

Mr. Eldridge said his client would consider whether he would appeal against the decision.

Owners' Liability for Drainage Works.

AT the Bromley Petty Sessions the magistrates were occupied for some considerable time in investigating a summons against Henry Ernest Cox, of 81, Martin's-road, Bromley, for £19 9s. 4d. claimed to be due from him to the Bromley Urban District Council in respect to drainage works carried out in connection with his premises. He disclaimed liability, and was represented by Mr. GEORGE WELLER, Mr. F. H. NORMAN appearing, as Clerk to the Urban District Council, in support of the claim.

Mr. Henry Nye, who is a member of the Council, apparently had some interest in the case, for he occupied a seat on the right of Mr. Weller, and instructed him practically throughout.

Mr. NORMAN opened the case, which was an exceedingly simple one, at some length, stating that the sum of £19 9s. 4d. was the amount apportioned on defendant in respect of taking up and relaying drains in Martin's-road. The drain in question took the drainage of 75, 77, 79, and 81, Martin's-road. Mr. Norman cited the law on the combined drainage question, and put in a letter received from Mr. Henry Clark, dated July 18th, from 27, Simpson's-road, stating that a nuisance existed at the property in question.

Mr. WELLER: What has that to do with me?

The CLERK: Why, that starts the whole thing. There must be a complaint in writing.

Mr. NORMAN then traced the progress of events, putting in the various documents—first, the power to inspect and open, given to the Sanitary Inspector under Section 41; the discovery of the cause of nuisance; the notice to repair, and then the correspondence, from which it appeared that in the first instance the defendant was under the impression that, being a combined drain, it was a sewer repairable by the Authority. However, it appeared that eventually the law was made clear to him, that where the combined drain receives the drainage of houses belonging to two or more different owners, it still remains private property; and on August 11th, the defendant and Mr. Nash, an adjoining owner, wrote to the Council, intimating their desire that the Council would do the work and charge them with the cost. However, the formalities had to be gone through, and finally, the owners failing to comply with the notices, the works were carried out under the superintendence of the Surveyor, at a total cost of £66 10s. 6d., and the amount apportioned to the defendant was £19 9s. 4d. That apportionment had never been formally disputed.

Mr. WELLER: I beg your pardon. It was disputed, and is now.

Mr. NORMAN replied that there was only one way to dispute apportionment, and presumed Mr. Weller knew what that way was. On the demand for payment the defendant asked to inspect the accounts, and was, after some correspondence with the Council, allowed to take a copy of the same. Final demand was served, and that had been ignored, and the proceedings were thus instituted.

Mr. NORMAN was then sworn and deposed to the formal part of his statement on oath.

In cross-examination, Mr. NORMAN said that at first the Surveyor refused to allow Mr. Cox to copy the bills, but finally he was allowed to do so.

The CHAIRMAN said that had nothing to do with the claim now before them.

Mr. Stanley Hawkings, the Surveyor to the Council, then deposed as to the carrying out of the works and produced a plan. He deposed also as to apportioning the cost amongst the several owners.

In cross-examination, Mr. Hawkings informed Mr. Weller that he could not understand Mr. Weller's reference to the rough plan which he put in on behalf of the defendant. He made no estimate of the cost of the work before giving an order for it, but he obtained a tender from one person only. He certainly called that a tender.

Mr. NORMAN asked the Bench to rule that this was totally irrelevant. The question of cost was not for the Bench. Their duties were purely ministerial, so long as the notices were in order.

The CHAIRMAN said that was so. This had nothing to do with the matter.

However, Mr. WELLER pressed the point very closely that a price from one person was not a tender, and finally elicited the remark from Mr. McKewan, one of the Bench, that Mr. Weller was wasting their time.

In further cross-examination, Mr. Hawkings said the work was done by Messrs. Crossley, but there was no contract.

Mr. WELLER then opened the case for the defendant, raising various legal points, the first being under Section 174 of the Act of 1874, as to contracts, that it being over £50 a contract should have been obtained.

Mr. NORMAN said that, as a matter of fact, less than £50 was paid to Messrs. Crossley. However, that did not now arise.

Mr. WELLER also submitted that the sum charged was excessive, and they had tendered £13, which they considered more than sufficient. Mr. WELLER then raised another point on the question of notice and proceedings.

Mr. WILLET advised the Bench that the Council were quite in order in their procedure.

Mr. HENRY NYE was sworn, and explained the plan produced for the defendant, which the Bench accepted. He indicated certain short lengths as to which the defendant denied liability.

In reply to the Bench, Mr. Hawkings said that one short part of the present drain was not shown on his plan, because its existence was not known of when the work was commenced. It was found in the course of the operations, and it was by the direction of Mrs. Cox that the drain was laid in its present form at that point. The portion in question formed a part of the general scheme.

Eventually, the Bench, after a careful consideration in private, ruled that the Council must succeed, and there would be an order for the amount claimed.

Mr. WELLER said he should ask for a case.

THE health of Calcutta is particularly bad, the total mortality being about double the average of the last five years.

MUNICIPAL ENGINEERING & SURVEYING.

CROSS-TABLE CHAT.

Every surveyor and draughtsman has, from time to time, to avail himself of the use of "French curves" or "ship curves" in drawing-office work, and his experience with these unscientific and haphazard aids is not generally conducive to serenity of temper and disposition. Let me advise all those who have perpetuated the use of such curves to lay them aside and adopt the "R.H.S. curves," which have been prepared after more years of study and practical trial than I care to mention, by that able civil and mechanical engineer and former Professor of Civil and Mechanical Engineering at Mason College, Birmingham, and Tokyo University, Japan—Professor R. H. Smith, A.M.I.C.E., A.I.E.E., M.I.M.E., &c. These curves, or drawing-office curve templates, consist of a set of twenty-three templates, giving all curvatures between 0 and 18ft. radius, and all shapes from ¼in. to 6in. variation of radius per inch arc.

Along the edge of each of the curves a scale of inches decimally divided is scribed and figured. When a part of one of these templates has been found suitable for a portion of a drawing, a note of that part of the template can be made for future reference in pencil or ink on the drawing. Each template or curve is named by its "inches variation of radius of curvature per 1in. length of arc." The series covers practically all the shapes occurring in artistic and technical designing, and in the plotting in diagram form of the results of physical, chemical, or physiological experiment and mathematical calculation, and a very short period of use with them will convince any practical draughtsman of their great superiority over the haphazard and fancy designs in the so-called "French" and "ship" curves. The price of the set of curves is 10s. 6d., and I may add that a book of instructions as to their use is issued with them.

Most Local Authorities now-a-days, I think, prohibit builders and owners who require to connect house drains to sewers from actually interfering with the pipes or conduits forming the sewer. The rule is one which ought to be made general in every district, for it is in the highest degree improper that the irresponsible workmen of builders should be allowed to tamper with, or to cut openings in pipe or brick sewers, where proper junctions have not been left, in order to insert saddle junctions. Just as well might gas or water companies allow builders and owners to make their own connections to gas and water mains as Local Authorities allow them to interfere with sewers. The damage caused to sewers where Local Authorities or their officials are so lax in administration as to permit the indiscriminate breaking into sewers by owners is inconceivable, for it is generally found, if a subsequent opening has to be made by the Surveyor at such points, that the sewer pipes have been broken, the end of the drain has been protruded into the sewer, or a quantity of cement has been allowed to pass into the sewer, any one of which will eventually induce blockage in the flow of sewage.

The importance of Local Authorities retaining absolute control over drain connections cannot be overestimated. Even where the Authority provide and fix actual junctions by their own workmen, free of charge, the practice is to be commended, and I know of many Authorities where this is carried out. On the other hand—and this practice is more general—the Local Authority by regulations made under Sec. 21 of the Act of 1875 enforce the payment of a fee, when the necessary application to the Surveyor is made for a connection, of from 5s. to 21s. to cover the cost of a proper junction and of labour in fixing the junction. Such labour, it should be understood, in no case includes excavation. In some cases a fee of £2 2s. is charged, one half of which is returned after a period of about three months if the surface of the road has been reinstated to the satisfaction of the Council's Surveyor. Some guarantee as to the latter should always be held, for it is inequitable that the public highway, which is provided for the use of all, should be permanently damaged for the benefit of an individual. But in any case Local Authorities should prohibit the indiscriminate tampering of their sewers by owners' and builders' workmen, and by regulation provide for actual junctions with sewers being made by their own staff.

Some zealous Surveyors which I have met from time to time are sufficiently enamoured of assuming the responsibility—which is rarely requited—of undertaking, through the Local Authority, the construction of house drains in public roads from the boundary of private premises to the sewer, the cost of which has, of course, to be borne by the owner. Where such a responsibility can be avoided, the general consensus of opinion among experienced men is that it should be so avoided. The added care and risks which have to be run in the possibility of endangering foundations when open trenches have to be cut, in accidents to foot-passengers or vehicles consequent upon the road being partially obstructed—for it is singular how accidents do happen to litigious persons when a Local Authority may be made defendants in an action—and the multiplication and doubtful recovery of accounts which is inevitable, do not warrant any Surveyor in assuming the burden either for himself or his Authority. There is nothing to recommend it except that of retaining absolute control of the roads, and if this were worth insisting upon, the Authority should equally undertake all work in public roads carried out by gas, water, and electric light companies.

Those of my readers who can afford to visit the Building Trades Exhibition which is being held at the Agricultural Hall, Islington, to-day or to-morrow, Saturday, when it closes, should not neglect the opportunity if possible. The show is better than any of its predecessors, and the municipal engineering section is alone worth a visit.

There is a movement on foot, instituted by the Royal Institute of British Architects and the Institution of Civil Engineers, to bring about, with the assistance of brick manufacturers, uniformity of size in building-bricks, and it is suggested that the length of a brick should be double the width, plus the thickness of one vertical joint; that four courses of bricks and four joints should be equal to 1ft., and that joints should be ½in. thick and an extra $\frac{1}{16}$in., making $\frac{5}{16}$in. for the bed joints to cover irregularities on the bricks, thus giving a standard length of 9½in. centre to centre of joints. The proposal to arrange a definite standard is made on account of the difficulty which is now so general in securing good bonding in consequence of the irregular sizes which are made, and is one which should be supported by municipal engineers, and has much to recommend it. It is intended to hold a conference at the Building Trades Exhibition this day (Friday) at 4 p.m., which will be open to municipal engineers.

Senex.

A model village is about to be erected by the Butterley Colliery Company in the Midlands. The houses will be semi-detached, and each will contain a bath-room, and have attached to it 400 yards of garden, while the houses and streets will be lighted by electricity.

NOTICES.

ANNUAL SUBSCRIPTIONS.—The Annual Subscription to "THE SANITARY RECORD," for the United Kingdom, paid in advance, is 12s. 6d. For the Colonies and Abroad, 15s This includes postage, and a Copy of the Diary, post free.

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APRIL 25, 1901.

INSANITARY GOVERNMENT OFFICES.

IN a recent article we dwelt at some length on the insanitary state of affairs existing in the Foreign-office. In the course of that article we pointed out the possibility of a similar state of things exising in other Government departments, and we regret to say our premonition has proved only too true. For some time past the insanitary state of the Post-office has been causing concern to the Telegraph Clerks' Association, who have made what is characterised as a half-hearted attempt to investigate the condition of post-offices generally. One hundred and eighty-two offices were approached, but of this small number it was found that sixty-nine were in a bad sanitary condition, defective ventilation, bad odours, bad drainage, and overcrowding being freely admitted. The Central Telegraph Office is described as being in parts very dirty, deficient in ventilation and exits. In most of the large towns a similar condition exists, and it is notorious that the London city offices are in a condition which it is no exaggeration to term as disgraceful. There are cases where dining-rooms are in close proximity to lavatories, and one can quite believe that the smells in the summer months are at times almost unbearable.

Under the present system the Medical Department of the Post-office is nominally responsible for the cleanly condition of their buildings, and yet it is curious to note what occurred in the General Post-office, London. The staff had complained frequently without avail, but the Committee promised to visit the building and allow one of the staff to show the members round. The result was that the report speaks of the building as incommodious and insanitary, and yet the Medical Department has its headquarters in the chief London office. The whole thing bears out the contention in our previous article, that these offices should be brought under the Factory Acts, and be subject to inspection the same as private workshops. It is, indeed, an anomalous state of affairs that the Government should pass laws for the community which it can of itself set at defiance, and that thousands of civil servants should be subject to conditions from which factory hands are happily exempt. If the Government had done its duty in this respect there would have been little to complain of; but, unfortunately, the very opposite has been demonstrated, and, while contracting itself out of the law of the land, the State has itself proved one of the worst offenders.

We commend these facts to those members of Parliament who have not quite yet forgotten that the British taxpayer exists for other purposes than to be made the victim of increased taxation, that the health of the community is no less important than Imperial aggrandisement, and that there are pressing social problems of the hour awaiting attention, which it is their bounden duty as representatives of the people to push forward. The welfare of the servants of the State may not constitute the alpha and omega of sanitary reform, but it is a striking index to the shortcomings of present-day legislation in matters affecting public health.

The New Scotch Provisional Order Procedure.

THERE has been considerable interest in Scotland during the last few weeks in connection with the inauguration of the new system of Provisional Orders in place of the old Private Bill procedure. The feature of the new system is local inquiry, con-

ducted by a Commission, partly parliamentary in its composition and partly otherwise, instead of inquiry at Westminster, and the very obvious advantage of the new procedure is an enormous saving in expense. An excellent example of the new system was furnished last week in Glasgow. The Provisional Order in this case was promoted by the Corporation, and fell into several branches, the most important of which had reference to sewage purification, authority being asked for the deviation of a certain sewer, part of the general system sanctioned by Parliament in 1898, and the erection of a pumping station in connection with it. As the counsel for the promoters explained in his opening statement, the scheme for the purification of Glasgow sewage, and the restoration of the Clyde to its ancient purity, began in 1894, when the Dalmarnock precipitation works were opened. These dealt with about one-fourth of the sewage of the city, and are now in full operation. In 1896 the Corporation got another Act authorising the construction of a set of sewers with an outfall at Dalmuir, some nine miles below the city, with similar purification works there; and when these are completed, probably in the course of a couple of years, the two sets of works will overtake the whole of the city sewage on the north side of the river. A third Act was obtained in 1898 for the construction of an extensive system to deal with the sewage of the city and neighbourhood on the south of the Clyde, the outfall being at Braehead, several miles down the river, where the works are to be situated. Under this last scheme, the main sewer is to be a high-level one —known as No. 1—running the whole way down to Braehead, at such a level that the sewage carried by it can be treated at the works without requiring to be pumped. Of the other sewers, some discharged by gravitation into No. 1; others, conveying the sewage of those parts of the city below the level of No. 1, had to discharge by means of pumping. Now, it happened that the site of one of these pumping stations was, while the Bill was still before Parliament, taken by the Caledonian Railway Company under compulsory powers for an extension of their line, and the result was that the branch sewer—No. 4—to which it should have been the terminus, led nowhere. The branch sewer was authorised, but as the pumping station, which was absolutely necessary for its connection with the main outfall sewer, was no longer available, the sewer was useless. The Provisional Order has now been brought forward to get over this difficulty. It is necessary to have a deviation from the original line of No. 4 authorised, with a pumping station in another locality, in order to effect the connection which is essential. That, in brief, is the situation with which this part of the Provisional Order is intended to deal. The inquiry was opened in Glasgow last week, and it will at once be seen how much it must conduce to the convenience of all parties interested—quite apart from questions of expense —to have an inquiry of this nature conducted locally. As the proposed site for the new pump-station is in a residential neighbourhood, there is considerable opposition on the part of the residents.

A Sewage Farm Arbitration.

An arbitration of considerable interest to Local Authorities has been brought to a close in London, after a protracted hearing before Sir Frederick Bramwell, C.E. The Corporation of Leicester in 1885 leased a sewage farm on a thirty years' lease from Sir Tristram Tempest, the owner of the Beaumont Leys estate, Leicestershire, and they now seek to acquire it under the Lands Clauses Consolidation Act. The land was originally leased at the rate of 45s. an acre, as agricultural land, and 100 acres of freehold land were sold at £130 per acre. The Corporation offer to pay only agricultural value for the land, and compensation for severance; but Sir Tristram Tempest claims that the whole of the Beaumont Estate has acquired the value of building land, and must be paid for as such. The amount of his claim is £407,944. The expert witnesses who gave evidence on his behalf valued the property at from £400,000 to £416,000; those for the Corporation varied in their estimates from £87,500 to £103,000. Such are the enormous discrepancies in valuations according to the standpoint of the witnesses. The award of the arbitrator will be looked for with interest.

The New Factory Bills.

The text of the Government Bill for the amendment of the Factories and Workshops Acts has now been issued. It contains fifty-three clauses. Power is conferred on the Secretary of State to make regulations for the safety of persons employed in any manufacture, machinery, process or description of manual labour used in factories or workshops which is "dangerous or injurious to health, or dangerous to life or limb, either generally, or in the case of women, children, or any other class of persons." Objections may be lodged to the draft regulations, whereupon the Home Secretary is to hold an inquiry, and the regulations must lie before Parliament for six weeks before coming into operation. The penalty proposed against any owner, occupier, or manager for infringement is a maximum fine of £10 for the first offence, and £2 per day for its continuance after conviction; and "any other person" who is bound to observe the regulation is to be held equally liable. The provisions as to sanitation, the prohibition of home work in any place where there is infectious disease, or which is injurious to health, are very stringent, as are also those dealing with the employment of children about moving machinery, the regulation of steam boilers, and the employment of children and young persons. There are special requirements as to laundries, bakehouses, and tin-meat factories, and some exemptions, such as fish and fruit-preserving businesses, and Irish creameries. The text of the Consolidation Bill has also been issued. It consolidates the provisions of the Factories Acts of 1878, 1883, 1891, and 1895, and the Cotton Cloth

Factories Acts of 1889 and 1897, and repeals those Acts as separate statutes, and it also repeals part of the Railway Employment (Prevention of Accidents) Act, 1900.

R. I. P. H. Congress at Eastbourne.

The arrangements for this important gathering are assuming definite shape, and already a fair outline of the proceedings has been issued. The Congress will open on Thursday, July 25th, when the Duke of Devonshire (who has consented to be President) will deliver an inaugural address. The following day, with Monday and Tuesday in the next week, will be given up to sectional meetings, and already several important papers have been promised. The presidents of the sections are thoroughly representative men, among whom may be mentioned Dr. Newsholme (Medical Officer of Health, Brighton), who will preside over the Preventive Medicine and Vital Statistics Section; Professor Frankland (of Edinburgh University), Chemistry and Meteorology; Sir J. D. Pile (ex-Lord Mayor of Dublin), Parliamentary and Municipal Hygiene; Dr. Frazer (Medical Officer of Health, Portsmouth), Bacteriology and Comparative Pathology; and Mr. R. Maynard Gloyne (Borough Engineer, Eastbourne), Municipal Engineering and Architecture. Among the notabilities who are expected is Professor Koch, the celebrated German *savant*, who has done so much to enlighten the world on the nature of tubercular disease. It is said that he will give at least one special address during the Congress. The social entertainments will be on an elaborate scale. On Saturday, July 27th, excursions will take place to Normanhurst, Battle Abbey, Lewes, Brighton, and Arundel. No doubt the first named will be the most popular, for Lord Brassey expects to be at home, and has promised to entertain a large party. There will also be numerous garden parties, the inevitable dinner, an illuminated fête, and a grand ball. Special arrangements have been made for the Sunday. The Congress sermon will be preached in St. Saviour's Church. Prior to the service the President and delegates will assemble at the Town Hall, where they will form into procession and march to the church. Robes and regalia are to be in evidence. Altogether the meeting promises to be a brilliant one, and the proposed arrangements reflect much credit on the honorary secretaries, Mr. H. West Fovargue (Town Clerk) and Dr. W. G. Willoughby (Medical Officer of Health), who, together with the Mayor, are bearing the burden of the preliminary work.

Progress at Leeds.

When Yorkshiremen once make up their minds to do a thing they do not stop at half measures. They believe in having the best that money can obtain, and if improvements can be made in the administration of an organisation or a city they are quite prepared to adopt them. With this object in view several members of the Sanitary Committee of the City Council have recently visited various towns with a view to see what can be done to improve the working of the Health Department of the City. Last week these members presented a report to the full Committee, in which were embodied the following recommendations:—(1) That a qualified medical man holding a diploma in public health should be appointed Assistant Medical Officer of Health and Chief Inspector of Nuisances, at a commencing salary of £300 per annum; (2) that, inasmuch as the accommodation of the Sanitary Department in the Municipal Buildings is altogether inadequate, and no possibility of increase presents itself, a house or other means of accommodation be found in the city for the purpose of sanitary offices; (3) that additional female Sanitary Inspectors be appointed at the present rate of wages (about £86), and that Miss Sharpells be appointed chief lady inspector at a salary of £100; (4) that voluntary notification of phthisis be sought, and that the inspection of cases and disinfection after death or removal be carried out; (5) that, as there is an extended tramway service in Leeds, and that at no other town visited is a carriage provided, the carriage hitherto employed for the use of heads of departments be discontinued. These recommendations were unanimously approved by the Committee, and we doubt not will receive endorsement when they come before the City Council. Latterly there have been considerable additions to the health staff of Leeds, and the present accommodation is altogether inadequate for the number employed. It is satisfactory to know that the women inspectors have proved so successful that already it is deemed wise to increase their number. This continued advent of women into the ranks of local workers is one of the best features of the day. There is so much that they can do better than men without encroaching in any way into the domain of the latter that no fears need be entertained about their ever obtaining any monopoly of the office. In any district where there are a large number of "home workers" the female inspector is an absolute necessity. This condition prevails in Leeds, and we are not surprised at the recommendation to increase the number of inspectors.

Fighting Malaria in Italy.

Our Consuls often give valuable information on matters other than that of the progress of trade in the countries they reside in. On the question of the sanitary progress of foreign nations their opinion is most valuable, as it is not that of persons paying a flying visit to a place and imagining they can sum up the position at a glance. There is a responsibility resting upon a consul, and he has to be careful that what he states can be substantiated, for people will act upon the strength of his opinion. Our readers are well aware of the interest manifested in recent years in the attempt to discover the secret of malaria—the disease which so long has defied the investigations of scientists. In his last report the British Consul at Naples gives some interesting information on the discovery of a connection be-

tween a certain species of mosquito and malaria. Some years ago, he says, a malaria map of Italy was published for military purposes, marking the worst districts in black, and those where the fever raged with less fierceness in grey; and it was shocking to see the amount of productive ground upon which no labourer could live in the summer season. To till the land or to perform the duties of the counting-house involved a tedious journey every night to a neighbouring hill-top, often many miles off, with an almost equally wearisome journey on the following morning. The question of malaria, he observes, is the most important social and economic question in Italy. Mosquitoes can be kept out of houses by means of wire blinds, and the Mediterranean Railway Company has spent a large sum of money in fitting these to their stations in the malarious districts. They have further provided their pointsmen and others who must be exposed at night with mosquito-proof clothing, and they have added a wire gauze porch to the houses, so that on nights when the temperature is tropical the families may sit out of doors with impunity. The result has been marvellous. To be appointed station-master in these districts was tantamount to a sentence of death, and no man could have his family to live with him in the summer with any prospect of their escaping the scourge, which affects one-third of the communes in Italy with more or less severity. But now the railway company have secured absolute immunity to their servants and their families, and even in such poisonous localities as Battipaglia and San Nicola the families in protected houses have been perfectly healthy.

Insanitary Houses at Dunfermline.

On some land owned by the Dunfermline Corporation a Colliery Company has some houses which have recently been the subject of correspondence between the Scottish Local Government Board and the Corporation. There are, it is said, some ninety-two houses on this property in an uninhabitable condition, twenty-three of them being beyond repair; and the Central Board has given notice that "the premises, or part of them, are of such a construction and in such a state as to be a nuisance or injurious or dangerous to health, that a nuisance therefore exists upon or in premises possessed by the Local Authority, or in which the Local Authority have an interest, and that the Local Authority have neglected or failed to perform the duty imposed upon them by the Public Health Act, 1897, and to take all due proceedings for the removal of the nuisance and preservation of health in the premises in question. The Local Authority are called upon to remove or remedy the nuisance, or take proceedings for the removal thereof within fourteen days, and thereafter to report to the Board what steps have been taken to put the premises in a habitable condition, or to close them, so as to remedy the nuisance referred to. Failing a definite answer to the satisfaction of the Board within twenty-four hours of the expiry of the notice, the Board say they will proceed further in terms of the statute." This is the gist of a communication received last week by the Corporation. A copy was ordered to be sent to the Colliery Company, with a request that it should act according to the terms of its lease and put the houses in proper repair. This, however, will not settle the matter, and the Town Clerk has been urged to investigate the legal position of affairs at the earliest possible moment. Local Authorities, if they expect others to carry out the law, must set an example, and, whatever it may cost, the Corporation must see to it that this insanitary property shall cease to exist.

National Health Society.

OFFICIAL TRANSACTIONS.

The lecturing work in the country districts is now drawing to a close for the season, so that we have very little to record this week. A few applications are still being received for single lectures or short courses, but in most cases the work is suspended until after the summer months.

Examinations have recently been held in Sussex and Oxfordshire, but the results have not yet been received from the Examiner.

Mrs. Westaway is again lecturing at Toynbee Hall, the subject of her two lectures being "The Hygiene of School Life," and "Nervous Diseases."

ASSOCIATION OF NATIONAL HEALTH WORKERS.

The Association has arranged for an interesting series of lectures on different subjects during the week commencing Monday, May 6th. The lectures will be given at 53, Berners-street, W., and all members of the National Health Society are invited to attend. It will be seen that the subjects of the lectures have been most carefully chosen, and are widely interesting and comprehensive.

Monday, May 6th, at 8 p.m.—Nursing as a Profession for Educated Women, by Mrs. Latter, late Matron of Chelsea Infirmary.

Tuesday, May 7th, at 3 p.m.—The Methods of Preventing the Spread of Disease in connection with School Life, by Arthur Newsholme, M.D. (Lond.), D.P.H., Medical Officer of Health for Brighton.

Tuesday, May 7th, at 5.30 p.m.—Women as Sanitary Inspectors, by Miss Alice Busk.

Wednesday, May 8th, at 8 p.m.—Disinfectants, by John Gay, M.R.C.S., L.R.C.P., D.P.H.

Thursday, May 9th, at 8 p.m.—Open-air Treatment of Consumption, by J. Edward Squire, M.D. (Lond.), D.P.H. (Camb.), M.R.C.S.

Friday, May 10th, at 8 p.m.—Vaccination, by Edward J. Steegmann, M.B., D.P.H.

Saturday, May 11th, at 3 p.m.—General Meeting of the Association of National Health Workers.

These Lectures will be given at 53, Berners-street, W., by kind permission of the National Health Society. All members of the National Health Society are invited.

The monthly "At Home" of the Association of National Health Workers will be held on Saturday, April 27th.

THE CHLOROS DISTRIBUTOR.

Recent experiments relating to the cleansing and disinfection of large areas, more particularly in regard to the outbreak of bubonic plague in Glasgow, have apparently borne splendid fruit. The difficulties to be met with in carrying out such cleansing have for a long time been apparent to Sanitary Authorities, but up to the period in question the problem remained unsolved. It was then that a bright idea occurred to Dr. W. J. Howarth, Medical Officer of Health for Derby, who was fortunate in communicating its purport to Mr. E. Shrapnell Smith, in whose astute hands it quickly assumed a practical shape. The result was the invention of the Chloros Distributor, an apparatus which marks a distinct epoch in the sanitation of big towns, from the street mains—the distributor first being inserted between two lengths of hose, and connected by means of a short piece of rubber pipe to the concentrated supply of disinfectant, the valve is then opened, allowing the disinfectant to be drawn into and thoroughly mixed with the water as it passes through the distributor for the final flushing. The flushing is continued until the desired quantity of disinfectant is distributed. In the course of the experiments in question it was demonstrated that with a water pressure in the street mains of 60 lb. per square inch, and distributing the mixture through a $\frac{3}{8}$in. nozzle, one gallon per minute of the disinfectant could be drawn into the distributor. Using a 1in. nozzle two gallons per minute were drawn in as a maximum. This amount can, of course, be regulated by the valve in the distributor to as low as a quantity of one quart per minute if desired. The

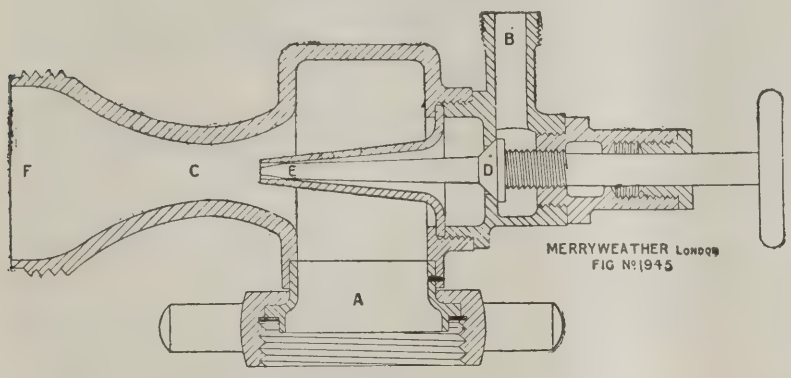
A PRACTICAL DEMONSTRATION OF THE CHLOROS DISTRIBUTOR.

market places, and thickly-populated districts. Like many ideas which accomplish great reforms, the Chloros Distributor is notable for its simplicity. This was effectually demonstrated at a recent trial at Messrs. Merryweather's works at Greenwich, where, before a party of pressmen and others, the distributor was put to a thorough test, performing what was required of it in a most efficient manner. The journey to Greenwich was taken in a motor car, kindly placed at the disposal of the party by the Motor Manufacturing Company, Limited, 47, Holborn-viaduct, E.C., and one cannot forbear confessing that this was not the least enjoyable portion of the demonstration. Arrived at Greenwich, the party adjourned to a spacious yard, where their arrival was evidently anticipated.

The method of working the apparatus (explained on this occasion by Mr. Maryon, Messrs. Merryweather's representative) is simplicity itself. The area is first thoroughly well flushed with plain water through hose manipulation was easily accomplished by two men, and the distributor in action, shown in the annexed illustration, is from an actual photograph taken on the spot. Appended also is a sectional illustration showing the mode of connection, &c. From this it will be seen that the distributor is connected to the hose from the street mains at A, and to the disinfectant supply at B. The water, under pressure from the mains by its increased velocity through the constructed passage C, draws the disinfectant through the pipe B, and the valves D and E, and thoroughly mixes it whilst so doing. The mixture is distributed through a suitable spreader attached to a hose connected to the outlet F. The supply of disinfectant can be regulated to any desired proportion by the adjustment of the needle valve E, or can be shut altogether at the valve D.

Such a practical demonstration of the distributor's efficacy as that afforded on the occasion of the visit to the works of Messrs. Merryweather, who are manufac-

turing the distributors for the patentee, leaves little doubt in our mind as to the important part which it is destined to play in the future, and we shall be very much surprised if it does not speedily become a part of the sanitary equipment of every city and large town in Great Britain and abroad. For abattoirs, fish markets, dairies, courtyards, approaches to fever hospitals, cab ranks, stables, and, in fact, all places where cleansing is



a necessity, it is essentially the one thing needful; and we consider that the United Alkali Company, Limited, through Mr. Shrapnell Smith, has conferred a distinct boon upon the community by placing it on the market. We understand that several large towns have availed themselves of the distributor. To those that have not yet done so we can only urge a thorough investigation into its merits, of which we cannot speak too highly.

REVIEWS.

Sanitary Engineering: A Practical Treatise on the Collection, Removal, and Final Disposal of Sewage, the Design and Construction of Works of Drainage and Sewerage and the Disposal of House Refuse and Sewage Sludge, with numerous Hydraulic Tables, Formulæ, and Memoranda, including an Extensive Series of Tables of Velocity and Discharge of Pipes and Sewers, specially computed by Ganguillet and Kutter's Formula. By Colonel E. S. C. Moore, R.E., M. San. Inst., &c. Second Edition, revised and enlarged, with 860 illustrations, including 92 large folding plates. Large 8vo. 791 pages. Price 32s. net. London: B. T. Batsford.

The fact that the first edition of this admirable work was exhausted within twelve months of its issue is the strongest testimony possible that it filled a want in the literature of the subject of which it treats, and in a manner which no other book now obtainable could do. The first edition found its way, of our knowledge, into the engineering offices of the Local Government Board and all similar Government offices, both in this country and abroad, and, we believe, into the library of almost every municipal engineer in the United Kingdom, and it was recognised as the standard volume of the subject of sanitary and sewerage engineering.

The new edition of the work serves to emphasise the high opinion we formed of the labours of the author when reviewing the first edition, and the exceptional care and ability which have been exercised by him in the compilation of the valuable matter which is found within its pages. The new edition contains some 170 pages of additional information to that contained in the first edition, and all reports, &c., are brought down to date, whilst numerous additional illustrations and plates have been added.

The aim of the author in compiling the volume was, as he states in the preface to the first edition, to bring together in a concise and practical manner such information as was thought to be needed for the guidance of those engaged in the important work of preparing and carrying out schemes for the efficient sanitation of our cities, towns, and villages, whether as engineers, surveyors, Medical Officers of Health, members of Municipal Authorities, or Sanitary Inspectors; in other words, a book of reference for all who are charged with the momentous duty of safeguarding and preserving the public health.

That he has succeeded in his work in every respect is beyond question, and we may add that it would lead to the promotion of efficient sanitation and the public health if this volume were to be studied by all classes of public health officials.

The first chapter in the book deals with the "conservancy" methods of excretal collection and removal. Then follows a chapter dealing with the principles and methods of the sewerage of towns. The flow of liquids in pipes and open channels is treated fully, as is also hydraulic memoranda and tables. Tables of velocity and discharge of sewers, pipes, and conduits occupy, sixty pages. The chapter on "Construction and Materials used in Sewerage and Drainage" is exceptionally well done and includes a description of the apparatus used for the construction and cleansing of drains. The perennial question of the ventilation of house drains and sewers and the numerous methods and devices adopted to combat the evil is dealt with. Chapters on the various kinds of traps used in house drainage, water-closets, and the methods of connection to the soil-pipes, flushing cisterns, sinks, &c., are given and illustrated very freely. Chapters also treat of surface-water collection, subsoil drainage, and "Sanitary Notes," which latter include the methods and apparatus for the testing of house drains and the disinfection of houses.

The subject of sewage disposal of necessity absorbs a considerable amount of space. It would be difficult to discover what system has not been included and described by the author, so well has he done his work. We certainly know of no other volume which contains such a reliable compilation of all the known systems of sewage disposal extant. The details given are ample, and are freely illustrated. There is a good chapter on refuse destructors, as well as one on chimney shafts, and an appendix containing a description of the Southampton sewerage scheme, and Drs. Clowes and Houston's third report on the Bacterial Treatment of London Sewage.

We recommend the second edition of this work to all Municipal Engineers and sanitary officials with the confidence that it is indispensable to them for the proper and efficient discharge of their duties. It is in every respect a capital book, and does infinite credit to author and publisher alike.

At a meeting of the Liverpool City Council last week, it was resolved to appoint a Special Committee to inquire into the condition and circumstances of life, both social and sanitary, of the very poorest of the people of Liverpool and their children. The scope of the inquiry is to be into the character and work in which these people are employed, parents and children alike, the means of getting to their work, the places where they are employed, the character of their dwellings, facilities for instruction, recreation, &c.; nature of prevalent diseases, habits of life, and any other noteworthy or exceptional circumstances in their surroundings.

SANITARY ASSOCIATION OF SCOTLAND.

An examination in Sanitary Science, conducted by this Association, was held at Glasgow on the 9th and 10th inst. Thirty-nine candidates presented themselves, of whom twenty-two passed. The names of the successful candidates are as follows, viz.:—James Anderson, Hamilton; Thomas Bartie, Selkirk; Matilda Campbell, Hamilton; James Carlton, Rothesay; David D. Crichton, Edinburgh; Andrew Crockett, Wishaw; Archibald Eaglesim, Paisley; James B. Easton, Moffat; John Fyfe, jun., Paisley; John R. Haddow, Moffat; Charles S. Jenkins, Glasgow; Allan W. Kennedy, Glasgow; Andrew Mather, jun., Motherwell; James Meiklejohn, Cambusmethan; Archibald A. M'Farlane, Glasgow; Robert M'Nicoll, Perth; Thomas Napier, Rothesay; James H. Patterson, Maryhill; William A. Philp, Glasgow; John C. Smith, Kirn; James A. Waddell, Burntisland; Alexander Young, Cumbernauld, The examiners were John C. M'Vail, M.D., D.P.H. (Camb.), Glasgow; Mr. Gilbert Thomaon, M.A., C.E., Glasgow; Mr. George MacKay, Perth; and Mr. William MacKison, F.R.I.B.A., C.E., Dundee.

Public Works.

SEWERAGE.

The Sevenoaks Council has received sanction to a loan of £3000 for carrying out the Bradbourne storm-water drains.

The Rural District Council of Stokesley has called in Messrs. Fairbank and Son, C.E., of York and Westminster, to prepare a scheme of sewerage and sewage disposal for Kirkleavington, in its Union.

A parliamentary inquiry into the proposed Provincial Order authorising Glasgow Corporation to construct a deviation of an authorised sewer, and conferring certain powers as to lighting and police matters, was opened on Friday last in the Burgh Court Hall.

The Corporation of Glasgow has been granted leave to erect a new and extensive sewage pumping station on vacant ground beside Partick Bridge and across the Kelvin from the machinery section of the Exhibition. The station is a part of the Corporation sewage scheme.

During a discussion on the report on the new sewage disposal works at the Bakewell Urban District Council, the Chairman stated that the engineers recommended the spending of £5000, and that meant a 12in. drain from the centre of the town, and running past the cattle market, along Granby-road, down Haddon-road, to the Willow Bed, and there septic tanks would be placed to receive the sewage of the town.

Having regard to the construction, at an early date, of tramways in Waterloo-road, Darlington-street, Lichfield-street, Piper's-row, Bilston-street, and Bilston-road, the Wolverhampton Sewerage Committee has instructed the Borough Surveyor to thoroughly consider the question of the storm and foul sewers in these thoroughfares and report whether any, and if so, what works were required in order to put the same in a good and satisfactory condition. A lengthy report has now been presented by the Borough Engineer, in which he recommends the construction of foul sewers, man-holes, and lamp-holes, between Molineux-alley and New Hampton-road; opposite the Baptist Chapel, Waterloo-road; Chapel-ash, Piper's-row, Bilston-street, Bilston-road; also a storm sewer between New Hampton-road and Bath-road, enlargement and extension of the storm sewer in Bath-road and other parts of the town, at a total cost of £876.

Mr. A. H. Smith, the arbitrator appointed by the Board of Trade on the Brynmenyn sewerage scheme, sat at the Dunraven Arms, Bridgend, on Wednesday in last week. There was a considerable difference in the valuations given on either side. The Arbitrator reserved his award.

The Nuneaton sewerage works at Hartshill are fast being got into shape. Some idea can now be formed of the extent of the scheme. Several of the beds have been laid out, and the works will cover a large piece of land when completed. The aspect of the district has already been very much altered by the operations.

At a recent meeting of the Bromsgrove Rural District Council, a report was received from Mr. Fiddian, engineer, Stourbridge, on the scheme for the drainage of Alvechurch. He suggested several modifications, and expressed the opinion that the estimate of the cost (£1200) was rather too low. It was decided to let the matter remain in abeyance until a report had been received from the County Medical Officer.

At a recent meeting of the Aberdeen Town Council, the Finance Committee reported that it had before it a statement prepared by the City Chamberlain in connection with the sewerage reconstruction account, and recommended the Council to give the statutory notice of its intention to borrow £20,000 on the security of the sewer rate, for the purpose of defraying the cost of making, reconstructing, and purchasing sewers. The minute was agreed to.

The Town Clerk of Sheffield has written the Norton Rural District Council stating that inasmuch as the objections of the Local Government Board with regard to the drainage of Dore emptying into the Sheffield sewers had now been removed, he saw no reason why the District Council's application should not be fully considered, and the terms for the admission of the sewage discussed, and that the Sewage Disposal Sub-committee had received instructions to deal with the matter.

At a special meeting of the Carnarvon Town Council, the estimates for the ensuing year were discussed. It was decided to make a district rate of 2s. 7d. in the £, to meet an estimated expenditure of £5443, of which £1978 is to be met in a way other than from the rates. A communication was received from the Local Government Board intimating that it would not sanction a further loan of £2200 for water supply purposes until the Council had carried on the other part of the scheme, which consisted of sewerage works at Rhyddu, as a protection against the pollution of the supply.

A special meeting of the Swansea County Borough Council was held last week to further consider the question of the Brynmill sewerage scheme. An amendment to the minute of the Water and Sewage Committee adopting the original scheme sanctioned by the Local Government Board was proposed. This amendment adopted the Pier-head scheme. The discussion on this was now continued, and the amendment was carried by fourteen votes to thirteen. Dr. Rawlings urged that the introduction of the septic tank would do away with every objection which had been urged against that scheme. It would save them £30,000, and would serve the needs of the district well, and for many years to come. After considerable discussion, Dr. Rawlings' amendment was put, and carried. The adopted scheme will deal with the sewage of a population estimated at 6500, living in 1037 houses, with an area of 270 acres, in the western and north-western part of Swansea town, and extending eastward as far as Uplands-terrace and Rhyddings Park-road. It will discharge by a sewer starting at the bottom of Brynmill-road, running thence seaward into the bay for a distance of nearly a mile in a south-south-easterly direction, and discharging at low-water mark spring tide.

A Local Government Board inquiry was held at West Bridgford last Thursday with reference to an application by the West Bridgford Urban District Council for sanction to borrow £7421 for the purchase of land adjoining its sewage farm for purposes of a refuse destructor, sewage disposal, stabling, &c., and £1100 for works of sewage disposal. Mr. Redgate, at the outset, stated that the population of the parish was now 7500, and the assessable value, in September, was £31,795 14s. With regard to the application for £1100, in 1899 the Council obtained sanction to borrow £4454 for a sewage disposal scheme of septic tanks and bacteria beds. This work was practically completed, but from the particulars furnished to the Board it would be seen that the estimate was too small, and that in carrying out the work other expenditure was incurred, chiefly through improvements to the patent alternating gear, so that the Council found it was short to the extent of £1100, for which it was now asking sanction to borrow.

The Birmingham Tame and Rea District Drainage Board has adopted a scheme under which a piece of land is to be sold to the Birmingham Corporation for the erection of a destructor, the heat from which will be utilised for the generation of electrical power to be supplied to the farm, on payment by the Board. The Chairman (Alderman Baker) pointed out that this would effect a saving in the cost of distributing the sludge, and would enable the whole of the farm, instead of only the Saltley portion, to be utilised for this purpose. It was decided to apply for sanction to loans to the amount of £22,000 for plant in connection with the scheme. On the adoption of the Works Committee's report being moved, Alderman Clayton pointed out that the engineer's recommendations appended to it involved a complete change in their system, namely, the adoption of the bacterial treatment of sewage. He suggested that if they had had the aid of modern science earlier they would have required a great deal less land. The Chairman and others replied that the new treatment was only in the experimental stage three or four years ago.

WATER.

The Government of Madras has sanctioned an estimate of Rs. 115,000 for the improvement of the water supply of Tuticorin.

At a recent meeting of the Skipton Rural District Council it was stated that the Kildwick water scheme had been satisfactorily completed.

A recommendation of the Wolverhampton Water Committee to purchase a gravity filtration plant for use at Cosford at a cost of £3500 has been adopted by the Council.

Col. Pepper, an Inspector of the Local Government Board, held an inquiry at Hythe recently into the application of the Town Council for sanction to a loan of £2800 for street improvements and £1400 for waterworks.

The St. Just Urban District Council having applied for sanction to borrow £3483 for works of water supply for St. Just Church Town, Mr. W. O. E. Meade King, M. Inst. C.E., recently held an inquiry on behalf of the Local Government Board.

A Local Government Board inquiry has been held at Rochford with reference to the proposal of the Rochford District Council to borrow £25,000 for works of water supply for Hadley, Hawkwell, Hockley, Rayleigh, Rochford, and South Benfleet.

The Linlithgow District Committee of the County Council has resolved to form the parish of Abercorn into a special water supply district. Objections to the proposal have been taken by the North British Railway Company and Messrs. James Ross and Company, Philpstoun Oilworks.

The Morley Town Council is about to construct additional water works at an estimated cost of £18,000; £4600 is also to be spent by that Council on stables and horses.

The Water Committee of the Dundee Town Council has had under consideration a complaint regarding want of water at University College, Dundee. It has been agreed to lay a 6in. main pipe in place of the 2½in. main in Small's Wynd.

At last week's meeting of the Southwark Borough Council Mr. Westcott moved a resolution expressing indignation at the action of the Government in causing the Water Bill of the London County Council to be thrown out by the House of Commons. The resolution was carried with only two dissentients.

With reference to the Rimington water scheme, the Surveyor has submitted a statement to the Bowland Rural District Council showing that the distance from the source of supply to the top of the village of Rimington was two miles, and the cost of laying a 3in. pipe with main tank, &c., would be £746; 2in. and 3in. pipes, the distance divided, £620; with 2in. pipes, £497. The scheme affected nine farms, one public-house, and ten cottage houses.

At the last fortnightly meeting of the Water Committee the engineer reported that the distribution of water both within and outside of the compulsory limits for the fortnight ending April 13th amounted to 350,306,000 gallons, compared with 58,269,000 gallons in the corresponding period of last year. The Chairman remarked that although there had been a decrease in the consumption of water, the revenue, fortunately, so far this year, showed an advance from £35,000 to £37,000. On the motion of Mr. J. T. Wood a vote of thanks was passed to Sir Thomas Hughes for his kindness in attending and giving evidence to the Royal Commission on Salmon Fisheries.

At the annual meeting of the shareholders of the Beverley Waterworks Company, the directors reported that pensions for the year ending March 31st last had been £1694 4s. 9d., against £1665 0s. 2d. for the preceding year. The working expenses had been £27 more than last year, owing chiefly to the very high price of engine coals and to extensions during the year. A new well had been sunk at the pumping station and the old well deepened, both being now 190ft. deep. The profit, after paying working expenses and laying new water services, had been £807 18s. 4d., which, after paying debenture interest and other preferential charges, and writing off irrecoverable arrears, left a surplus of £439 19s. 11d. It was decided, on the recommendation of the directors, to pay a dividend of 4s. 6d. per share (£10) and to carry the balance, £34 19s. 11d., to the extension account 1898 R.

The report by Sir William Crookes and Professor Dewar on the composition and quality of the water supplied to London last month states that they examined 208 samples and found all to be clear, bright, and well filtered. The rainfall at Oxford during the month was 1·44in., or 0·03in. below the average for the last 35 years, and the total deficit for the year is 1·56in., or 29·1 per cent. on the 35 years' average. Of the 467 samples of impounded and filtered water supplied to London, examined bacteriologically during the past month, 20 samples, or 4·2 per cent., were sterile. Only 10 samples out of the total number examined contained more than 150 microbes, and 29 samples, or 6·2 per cent., contained more than 100 microbes per c.c. The mean of the microbes in the excess samples was 162, against a corresponding mean last month of 151. Nearly the whole of the excess results occurred during the early part of the month, when the climatic conditions were unusually exceptional.

THE Easingwold Rural District Council had before it at a recent meeting the tenders for Contract A for the district waterworks, viz., for the supplying and laying of some 29 miles of water mains, valves, hydrants, &c. The tender of Mr. Charles Firth, of Scarborough, for £13,186, was accepted by the engineers. Messrs. Fairbank and Son, civil engineers, of York, were instructed to proceed with the works with as little delay as possible.

LAST week the chairman (Alderman Holdsworth) and deputy-chairman (Alderman Milner) of the Water Committee, and the chairman (Mr. Trotter) and the deputy-chairman (Mr. Triffitt) of the Baths Committee of the Bradford Corporation conferred together, with the aid of the Mayor (Mr. W. C. Lupton), with a view to the settlement of the question which has arisen between these two Committees in regard to the charges for water supplied to the public baths. The conference arose out of Alderman Holdsworth's notice of resolution for the Council meeting of to-day rescinding a motion passed at the last previous meeting of that body directing that the charge should not exceed 3d. per 1000 gallons. It was agreed that Alderman Holdsworth should withdraw his motion for the present, without prejudice to his right of further action, pending a discussion of the question by the two Committees.

THE ceremony of turning the first sod of the Bewdley waterworks was performed last week by the Mayor of that borough, Mr. Langley Kitchin. For a long time past Bewdley has greatly needed a public water supply, and there has been intermittent discussion of the question for twenty or twenty-five years. The Corporation has adopted a scheme put before it by Mr. Berrington, C.E., of Wolverhampton, and gets its supply of water from a well bored through the new red sandstone near Blackstone rock, on the Severn side—a spot well known to visitors to Bewdley. There is a 12in. bore hole, sent down a depth of 200ft., and this will give a supply of 300,000 gallons of water per day—enough for the wants of Bedley and also of Wribbenhall, if the latter place should wish to take a supply of water from this source. The water is to be pumped to a reservoir on Mount Pleasant, a spot which is notable for its clump of firs, which have long been a landmark to oarsmen on the Severn. The reservoir at this point will afford storage for 200,000 gallons of water, and will meet the wants of the lower part of Bewdley. There will be another reservoir at an elevation of 535ft. above sea level on the Cleobury-road, and this will store 60,000 gallons of water, and supply the high-lying part of Bewdley. The contract for the work is £10,600.

LIGHTING.

THE Wells Town Council has decided to offer for sale their Provisional Order for electric lighting.

A PETITION has been lodged in favour of the Yorkshire Electric Power Bill by the Mirfield Urban District Council.

THE Worksop Urban District Council has decided that steps be taken to obtain a loan of £10,000 for electric lighting.

THE Wolverhampton Town Council has received the sanction of the Local Government Board to a loan for electric lighting purposes.

THE sanction of the Local Government Board to the borrowing of £2529 for the extension of the gas mains has been received by the Abertillery District Council.

THE Colwyn Bay District Council has received several tenders in connection with the extension of the electric lighting plans, and the following contracts have been given to Messrs. Bertam, Thomas, and Co., Manchester:—Water-tube boiler, &c., £1298; switchboard, £63; and dynamo, £1347.

ELECTRIC lighting works are to be carried out in the urban district of Hoylake and West Kirby, at a cost of £12,000.

A GOVERNMENT inquiry was opened at Leeds last week into the proposal to borrow £500,000 for electric lighting purposes in Leeds.

THE contract for the electric installation at the Victoria Infirmary, Glasgow, has been placed with R. D. Cassells and Co., Glasgow.

COLONEL W. LANGTON COKE, M.I.C.E., held an inquiry at Cheltenham recently to inquire into an application by the Town Council for sanction to a loan of £6150 for the purpose of electric lighting.

THE new company which has taken over the Wivenhoe Gasworks has decided to reduce the price of gas from 5s. 10d. to 5s. 6d. per 1000 cubic feet for illuminating purposes, and to 4s. 6d. per 1000 feet for cooking and motive power.

THE Arbroath Gas Corporation some time ago decided to undertake the electric lighting of the burgh in preference to handing it over to a company. At a meeting of the Corporation last week it was decided that, while adhering to its former position, in consideration of special circumstances, it resolves to delay the whole matter for further consideration.

A MEETING of the Works Committee of the Hull City Corporation was held recently, when it was resolved to accept the offer of the Electric Lighting Committee to erect twelve electric arc lamps in the new street from Whitefriargate Bridge to Prospect-street. The cost per each lamp will be £22 per annum. Alderman Larard stated that the difference between gas and electricity would be about £40 in favour of the former.

THE Scunthorpe gasworks are now completed. Mr. Stevenson, the gas and waterworks engineer, has made a thorough inspection, and expressed himself well satisfied. Within a fortnight the ratepayers will be supplied with gas from their own works. The position with regard to the waterworks is just now one of anxious suspense for all concerned. The first tests have proved the water to be too salt for drinking, and too hard for domestic purposes. It is probable that the opinion of one of the highest authorities on water supply in England will be taken on the present position before further experiments are made.

THE Committee of the Newburgh Town Council appointed to make inquiries into the potentialities of the water power in the neighbourhood for an electric installation, accompanied by the Town Clerk, Mr. A. M. Sneddon, and Mr. Hawton, electrical engineer, visited Lochmill, Craigmill, and other places of interest last Thursday afternoon. A report will be prepared shortly as to the feasibility of a scheme, and the advantages of water and engine power, as well as general cost. A number of successful installations have been introduced into small English towns, copying the experience of Swiss towns, where they are common.

THE newly-appointed Electric Lighting Committee of the Northfleet Council reports that after carefully considering the status and experience of the various electrical engineers whose names had been introduced to the Committee, the Clerk was instructed to write Messrs. Preece and Cardew to ascertain the terms upon which they would undertake to advise in matters electric. The Clerk was also instructed by the Committee to approach the Committee of the Gravesend Town Council to ascertain whether, in view of the fact that they were advised that a united district for matters electric was unknown to the law except when constituted by special Act of Parliament, they would entertain a scheme whereby Northfleet could take from Gravesend a supply of electricity at a price based on profit and loss for a limited term of years.

GENERAL.

The Ramsgate Corporation has decided to provide a lodge and ladies' lavatory at Ellington Park.

The Chester Town Council has decided to adopt Part III. of the Housing of the Working Classes Act, 1890.

The Bromley and Beckenham Joint Hospital Board is about to enlarge its hospital by the erection of new diphtheria wards.

The Local Government Board has sanctioned the borrowing by the Lymington Town Council of £2500 for the paving of Quay-hill, High-street.

We understand that the Corporation of London, Liverpool, and Manchester have each contributed the sum of 100 guineas to the funds of the British Congress on Tuberculosis.

A Local Government Board inquiry has been held by Mr. Ducat at Gosport into the application of the Gosport District Council to borrow £3840 for the purpose of erecting workmen's dwellings.

The census which has just been taken of Sydney (New South Wales) and suburbs, comprising an area of 142 square miles, shows a population of 488,968, being an increase of 102,109 during the last decade.

We understand that Lord George Hamilton, Secretary of State for India, has accepted the invitation of the Ealing Urban District Council to perform the ceremony of declaring the Walpole Park open on May 1st. The park, which is about thirty acres in extent, has been acquired by the District Council from Sir Spencer Walpole for the sum of £40,000. It was formerly for many years the residence of the late Right Hon. Sir S. H. Walpole, who died there in 1898. The park is well wooded, and it is intended as far as possible to retain it in its present form.

We clip the following from the *South African Review*:—"On the outbreak of the bubonic plague the Town Council began to abuse the public for their dirty habits, and to issue a series of proclamations and edicts concerning what we ought to do, or ought not to do, conveniently leaving out of consideration their own shortcomings. Amongst the documents issued was one warning the inhabitants against placing house-refuse receptacles in the public streets. As far as I can make out, the only person who has infringed this regulation is Mr. Wynne Roberts, our City Engineer, who was brought before the magistrate on Tuesday last, the 19th inst., and fined 5s. as punishment for his crime." We are indeed surprised that any public officer should set so lax an example, and it is greatly to the credit of the Authorities that they did not hesitate to prosecute him.

The Rev. Andrew J. Forson, Morison E.U. Church, Dundee, recently visited the slums of the city, and has given his impression of what he saw there. In some cases, he says, the houses at which he called were mere shells, small rooms, and with little or no furniture. In order to remedy the fearful state in which several of the people in the slums lived there must, in his opinion, be a systematic visitation of these districts. If some of the men in the Church were to visit the houses and advise the people there in regard to their intemperate habits and get them to sign the pledge and keep a close watch over them, great good could be done. This was the particular work to which he invited those men who were willing to do some real and lasting good in the community. There was great scope in the slums for women workers. They could get the women of the slums to sign the pledge, teach them cleanliness, and give practical encouragement to those who showed signs of improvement. It was in work of this nature alone that they could hope for a betterment of the conditions of slum life.

The Beverley Town Council has resolved to procure a steam roller from Messrs. C. Burrell and Son, at a cost of £433 6s.

The movement for securing better cottage accommodation for the labourers in Ireland is alleged to be creating ill-feeling on the part of the farmers in the South of Ireland.

A Local Government Board inquiry has been held at Clayton by Lieut.-Col. A. C. Smith relative to an application of the Council for sanction to borrow certain moneys for improvement works, as follows:—£3779 for works of private street improvements, £683 for public street improvements, paving of Albert and back Albert-street (which is a highway repairable by the ratepayers), and £1700 for purposes of public offices.

In his report to the Merthyr District Council for the year 1900, Dr. Simons, the late Medical Officer, referring to the question of overcrowding and the housing of the working classes, says that overcrowding is common all over the district. The class of houses proposed to be built were not the class which were overcrowded. What was wanted were houses to let at 10s. to 15s. per month. The closing of insanitary houses should be proceeded with.

The sum originally offered by Mr. Carnegie to build and equip at Dunfermline the baths and gymnasium was £20,000. Competitive plans were sent in, and it was found that in every case the probable cost exceeded the sum at the committee's disposal. Mr. Carnegie has since agreed to increase the amount he had offered for the construction and equipment of the proposed buildings, so that the committee might be free to choose the design which they thought most suitable; but he relies on the committee satisfying themselves that the accommodation to be provided, while ample, should not be in excess of the probable future requirements of the town, and that there should be no expenditure on needless display. The town is providing a site for the new buildings at a cost of £4000.

A Board of Trade inquiry has just been held at Cardiff by Major Druitt into an application of the Corporation for sanction to a loan of £277,630 for tramway purposes. It was stated that tramways are to be worked on the overhead trolley system, and, reduced to single lines, they will run to fifteen miles. As to the £850,000 authorised under the Act for new tramways in the borough, it was stated that, after deducting the amounts expended and estimated to be expended for the construction and electrical equipment of the tracks and wood paving of the roads, there remains a balance of £144,614 to be borrowed for new tramways, and this sum is included in the sum of £277,630, the subject of the present inquiry. A further application is to be made in due course for sanction to a loan for the acquisition and conversion of the existing tramways.

Last week at the Wolverhampton Town Council the recommendation that the salary of Dr. Malet, Medical Officer of Health, be increased to £400 per annum was approved, but before it was passed Councillor Pratt said that, in view of the increase in that department of up-to-date towns, it was necessary that the Medical Officer should give the borough his whole time. Fresh work should, in view of the rapidity with which things were moving, be undertaken if Wolverhampton was to keep in the van. They could not have a better man for the post, but he should give the town the greater part of his services, with, of course, an adequate salary. Alderman W. H. Jones, while in sympathy with the general trend of Councillor Pratt's remarks, thought it was too much to expect Dr. Malet to give up the offices he held as a medical man, for his services were much required. Councillor George R. Thorne said it was difficult at that juncture to discuss such a change of policy.

Last Monday the London County Council (General Powers) Bill came before Mr. Campion, one of the Examiners of Standing Order Proofs of the House of Commons, on an application for leave to insert an additional provision. The new provision deals with the acquisition of Horniman Park and Museum, in the parish of Lewisham (formerly in the parish of St. Giles, Camberwell). The buildings and estate—fifteen acres in extent—have lately been presented to the Council by Mr. Frederick John Horniman, of Falmouth House, Hyde Park-terrace, and as certain of the houses are still in the hands of tenants the Council were in doubt as to whether they could proceed to devote the property to the use of the public without legislative powers, hence the new provision. The Examiner found that the notices required by the Standing Orders had not (by the necessities of the case) been given, and reported non-compliance. The Standing Orders Committee will consider whether the rules in the case of the new provision shall be dispensed with.

On the invitation of the Cleansing Committee of the Glasgow Corporation, a large company recently visited the refuse despatch works, Charles-street, St. Rollox, Glasgow, to see started the clinker-crushing and screening machinery which has recently been erected there. All the refuse collected throughout Glasgow during the night is now mechanically treated, and is either cremated or despatched by rail to the country by the following morning. As the result of the cremation there is a residuum of about 30 per cent. of clinker. As it has been subjected to a heat of from 1700 deg. to 2000 deg., it is perfectly innocuous. To meet the requirements of customers, the Committee has now erected screening machinery, which enables the department to produce the clinker in five different sizes, viz.:—Sand through ¼in. ring, and clinker through ¾in., 1¼in., 1¾in., and 2in. rings. By this means the clinker is thoroughly cleaned, and being harder and lighter than broken bricks or other material, it is admirably adapted for making concrete. A straining test of 410 lb. per square inch has been applied with satisfactory results.

A Local Government Board inquiry was held on Friday last at the Stratford Town Hall, with reference to an application for the issue of a Provisional Order or Orders under Sec. 303 of the Public Health Act, 1875, to partially repeal, alter, or amend (1) the West Ham Corporation (Loans) Act, 1888, as amended by the West Ham Corporation Act, 1893, and the West Ham Order, 1897, so as to enable the Corporation, subject to certain conditions and restrictions, to exercise any statutory borrowing powers they may possess for any purpose, either wholly or partially, by using for such purpose any money for the time being forming part of the Loans Funds not required for the payment of dividends on Corporation stock; (2) the Provisional Order relating to West Ham, confirmed by the Local Government Board's Provisional Orders Confirmation (No. 11) Act. 1891, so as to enable the Corporation to borrow, with the sanction of the Local Government Board, additional moneys for the purpose of that order; (3) the West Ham Local Board Extension of Powers Act, 1884, so as to enable the Corporation to carry into effect an agreement for the leasing of certain lands acquired by them under that Act for the purpose of constructing a pumping station for sewage and other works, and to carry into effect such other arrangements with regard to lands of which the Council may from time to time be seized or possessed as the Local Government Board may sanction; (4) the West Ham Corporation (Improvements) Act, 1888, and the West Ham Corporation Act, 1893, as amended by the West Ham Order (No. 2), 1895, and the West Ham Corporation Acts of 1898 and 1900, so as to enable the Corporation to utilise certain lands at Canning Town, which they were by the Act of 1888 authorised to acquire for sewage purposes for the erection thereon of an electrical generating station for lighting and tramways purposes in substitution for lands authorised by the Acts of 1898 and 1900 to be used for these purposes, and so as to confer on the Corporation other powers in regard to the use or disposal of lands acquired under the Acts of 1888 and 1893.

PERSONAL.

Mr. H. Simpson has been re-elected Inspector of Nuisances for Worksop.

Mr. H. W. Chadwick has been appointed Surveyor for the Town Council of Ormskirk.

Dr. P. L. Benson has been reappointed Medical Officer of Health for the Rural District of Buckingham.

Dr. R. W. Pierce, of Chelmsford, has been appointed Medical Officer of Health for Woking at a salary of £80.

Mr. R. W. Marshall, of Fenton, has been appointed Surveyor and Sanitary Inspector for the Urban District of Uttoxeter.

Mr. Robert Reid, Burgh Surveyor, has been appointed Clerk of Works for the additional sewerage works at Rattray.

Dr. Dickman has been appointed Medical Officer of Health for the Worthing Urban District, in succession to Dr. Higginson.

Dr. Anningson has been reappointed Medical Officer, and Mr. Archer Inspector of Nuisances for the rural district of St. Ives.

The salary of Mr. J. M'Combe, the manager of the electric tramways, has been increased from £300 to £350 per annum.

Mr. J. S. Hendry, of West Bromwich, has been engaged to carry out a sewerage extension scheme at Cannock, involving an expenditure of £25,000.

Mr. Rowland Plumbe, F.R.I.B.A., has resigned the office of District Surveyor, under the London Building Act, for the District Surveyorship of West Hampstead.

The Local Government Board has sanctioned the reappointment of Mr. C. Gander as Sanitary Inspector and Highway Surveyor for the rural district of Alcester.

Dr. E. R. Morgan and Dr. Trafford Mitchell have been re-elected Medical Officers under the Llangyfelagh District Council, at salaries of £60 and £100 per annum respectively.

Mr. John S. Lloyd, M.R.C.V.S., has been appointed Veterinary Inspector for the City of Sheffield, at a salary of £300 per annum, rising by advances of £25 per annum to £400.

Mr. Oswald Graham, late Clerk of Works to the Electric Lighting Committee at Middlesbrough, has been appointed to a similar position under the Urban District Council of Whitby.

At the special meeting of the Shoreditch Borough Council, the Mayor, Mr. H. E. Kershaw, J.P., presented on behalf of the Council a handsomely-framed illuminated vellum to Mr. Joseph Cox, in recognition of his able, courteous, and impartial conduct of the business of the Vestry during his term of office as chairman of the last local Vestry.

The Parish Council of Langley, near Slough, have appointed a lady as Inspector of Slaughter-houses for the destruction of horses. She will be paid by fees, and as Langley is the centre of the horse-slaughtering industry for a very wide and populous district, the office is a lucrative one. This, we think, is one of the positions not fitted for a woman to take. It may be sentimental on our part, but, from personal experience, we distinctly assert that the slaughter-house is no place for a woman.

Mr. Ernest A. Borg, assistant Borough Surveyor of Margate, has been granted an honorarium of thirty guineas for preparing parliamentary plans, making water survey, &c., in connection with the proposed new water supply scheme for the borough.

The Leamington Town Council has accepted the resignation of Mr. Henry Consett Passman, who for over a quarter of a century has occupied the position of Town Clerk of the borough. Mr. Passman, who went to Leamington from Stafford, contends that during his period of office he has saved Leamington £25,000 by his successes in litigation. On one occasion, when the assets of the Corporation were sequestered, he kept the town going by paying its expenses out of his own pocket until sequestration was removed. He was first Town Clerk of the borough on incorporation. Previously he was clerk to the Leamington Local Board. Mr. Passman's resignation, which is due to advancing age, has been accepted with regret.

NOTES AND QUERIES.

Subscribers may obtain advice on matters appertaining to Public Health Law and Municipal and Sanitary Engineering. Letters should be addressed "Notes and Queries," The Sanitary Record, 5, Fetter-lane, London, E.C. If an answer be required immediately, a stamped addressed envelope must be enclosed

2171.—Cleansing Houses of Persons in Receipt of Parish Relief.—"Inspector" writes:—"In my district there are many houses occupied by poor persons who live alone and are in receipt of parish relief. In many cases these persons are infirm and ill in bed, and the occupier is unable to cleanse the house, or pay for same being done. Can we call upon the owner, or is the Relieving Officer responsible?"

Answer.—The Relieving Officer may, and in our opinion, should, in most of such cases, where the persons who are infirm and unable to cleanse the houses which they occupy, obtain an additional allowance from the Guardians for the purpose of securing the cleansing of such houses. If the Infectious Diseases (Prevention) Act, 1890, has been adopted in the district, the Local Authority may, if they so deem necessary, on the report of their Medical Officer of Health, cleanse and disinfect the premises at the cost of the Authority.

2172.—Sanitary Institute Congress: Place and Date not Fixed.—"W. S." writes:—"For the information of your readers will you kindly say whether there is likely to be any Science Congress in connection with the Sanitary Institute during the present year, and if so, where it is to be held?"

Answer.—From inquiries we have made we learn that the Sanitary Institute has not yet decided whether a Congress is to be held during the present year under their auspices, and that no place has yet been selected as to where the next Congress will be held.

2173.—Surveyor and Gas Engineer: Appointment; Salary.—"Inquirer" writes:—"Kindly let me know if it is usual for the Town Surveyor to be Gas and Water Engineer also? And what would be the average salary of such an officer under an Urban Council having a population of 20,000 inhabitants?"

Answer.—Our correspondent omitted to enclose us his name and address, and his reply has been delayed in consequence. These particulars are necessary as a guarantee of good faith, though we make the rule, which is invariable, that the names of querists will not be published or divulged. With particular reference to his query, we have to state that the Surveyor to an Urban Authority is frequently also Gas and Water Engineer, and such a combination in the hands of a competent officer is beneficial and economical to the Local Authority. As to the average salary payable to such an officer, this we are unable to ascertain, but it should not be less than from £400 to £600.

2174.—Public Health (London) Act, 1891: Qualifications of Sanitary Inspectors.—"S. B. T." writes:—"Could you clear up a point as to which I am in doubt with respect to the qualifications of Inspectors under the Public Health (London) Act, 1891? I have the certificate of the Sanitary Institute, dated July 29th, 1899, also plumbers' certificate. In a recent advertisement in The Sanitary Record, it says: Any person who passed the examination of the Sanitary Institute previous to December 31st, 1899, would be on the register of the Sanitary Inspectors' Examination Board. Now, at the foot my certificate it states: 'This certificate is not registered under the Public Health (London) Act, 1891.' Does this debar me from entering for London appointments? I may add that I was not an Inspector previous to 1895."

Answer.—The querist is under a misapprehension. Certificates granted prior to December 31st, 1898—not 1899—by the Sanitary Institute are recognised as qualifying candidates for the office of Sanitary Inspector under the Public Health (London) Act, 1891. The querist is therefore not qualified, and it will be necessary for him to pass the examination of the Sanitary Inspectors' Examination Board before he can be qualified for appointment as a Sanitary Inspector in London.

2175.—Alumino-Ferric for Precipitation of Sewage.—"A. B. C." writes:—(1) "What is the best means of mixing alumino-ferric with raw sewage in proper proportions? (2) How much raw sewage is precipitated by one gallon of saturated solution of the alumino-ferric, such solution containing 7½ lb. in one gallon?"

Answer.—(1) Inasmuch as the sewage of every town differs so considerably in character, it is inadvisable and foolish to apply any chemicals such as Spence's alumino-ferric except after obtaining an analysis of the sewage and the advice of a chemist or that of the manufacturers, Messrs. Peter Spence and Sons, Limited, Manchester, as to the proper proportions to be used. We advise that this course be followed by the querist. (2) We are unable to advise with the information before us. The querist might usefully communicate with the firm named, who would give him all the information possible.

2176.—Building after Notice of Disapproval of Plans. "Y. R." writes:—"My Council recently disapproved the plans of a proposed school. Notice of disapproval was given the architect without specifying in particular the various reasons for disapproval. The architect, however, says that they are not out of order, and is proceeding with the building. No surface drainage is provided for, as shown by Bye-law 60 (see bye-laws herewith), and no window is shown in the water-closet. The drains are shown as proposed to be connected to an existing drain, but the surveyor contends that they should be shown to be connected to a proposed sewer in the road. The Council have decided to prosecute the architect. Will you please advise whether the Council will be enabled to succeed, and what should be their next step?"

Answer.—The notice of disapproval to be effective must be given within a month of the date of deposit of the plans. If the

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plans were in conformity with the bye-laws the builder might proceed although the plans were disapproved, but he must give the notices as to intending to commence the erection of the building and also before commencing to cover up the foundations, and if these have not been sent proceedings may be taken against him. The Council must determine against whom proceedings are to be taken—the architect, builder, or the proprietors of the school. The Council may also, if any bye-laws are contravened in the erection of the building, sue for penalties for breach of the bye-laws, and may, after giving notice to the builder under Clause 99 of the bye-laws, pull down so much of the building as contravenes the bye-laws. The non-provision of surface drainage, and non-provision of windows in the water-closets are contraventions of the bye-laws, and the Authority will be able to succeed in proceedings for a recovery of the penalties, if in the execution of the work these are not carried out. The Council are not enabled to disapprove the plans, because the drainage is not carried directly into the road as suggested, and this should not be pressed.

2177.—Powers of Sanitary Authorities. — "Student" writes:—"What powers as to the abatement of nuisances have (1) Urban Sanitary Authorities, (2) Rural Sanitary Authorities, (3) Factory Inspectors, under the Public Health Act, 1875? Also under the Factory and Workshop Acts?"

Answer.—We are unable to find space in this column for answers to ordinary questions set at Inspectors' examinations. It is evident the querist has not read any book on the Public Health Acts. He should procure Reid's "Practical Sanitation," price 6s., and study the subject with the aid of an experienced "coach," such as advertise in our pages. He might also obtain "Model Answers to Questions set by the Sanitary Institute," price 2s. 2d. Either of the books may be obtained from the office of this journal, but the new edition of the latter is not yet ready.

2178.—Overcrowding of Dwelling-houses.—"Inspector" writes:—(1) "If the occupants of a house are so numerous that a cubic space of 300 cubic feet is not allowed in the bedrooms, can the tenant claim to use the house, kitchen, or other rooms as sleeping-rooms before a conviction can be obtained? (2) Can you find a case in point? (3) Am I right in assuming that a house is overcrowded when the number of the occupiers is greater than would allow 300 cubic feet for each adult in the bedroom?"

Answer.—(1) If rooms in the house, such as the kitchen, &c., are actually used as sleeping-rooms, the tenant is entitled to use such. But rooms not so used cannot be counted as cubic space in estimating as to whether overcrowding exists. (2) No. (3) There is no statutory provision that 300 cubic feet must be allowed for each adult. It has, however, come to be accepted as a standard, and the evidence of the Medical Officer of Health will be essential in order to support this. The Authority would not obtain a conviction for overcrowding the bedrooms if the occupier proves that other rooms are used as sleeping-rooms, and that in the aggregate a cubic space of more than 300 cubic feet is provided.

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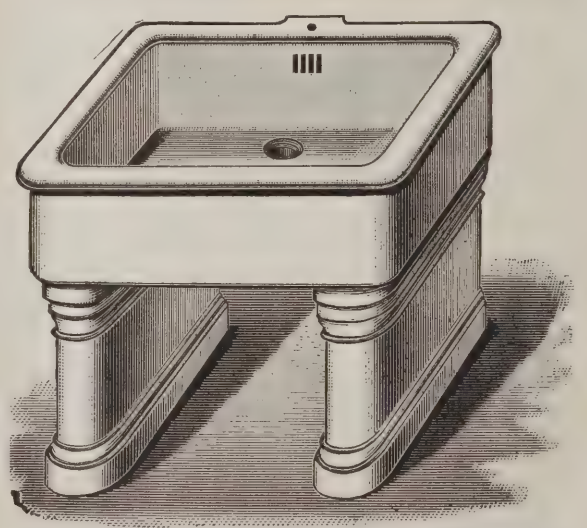

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GENERAL SUGGESTIONS AS TO BACTERIAL TREATMENT ON BACTERIAL LINES.*

By W. J. Dibdin and C. Chambers Smith.

Without entering into questions of detail, the principles which are now generally accepted as necessary to be observed in regard to processes for the purification of sewage may be shortly summarised as, first, the removal of the coarse solid matters held in suspension; and, secondly, the treatment of the finely-divided organic matters left in suspension, as well as impurities in solution by utilising the agency of the living organisms known as bacteria.

These objects may be accomplished in various ways, viz., the solid matters may be stopped by means of gratings or screens of various degrees of fineness, and the refuse so collected dug into ground; or it may be allowed to subside in the usual precipitating tanks and removed from thence and pressed as in the old methods of chemical treatment; or it may be arrested and liquefied in detritus tanks; or, again, it may be run on to very coarse-grained bacteria beds; or, lastly, by the method adopted at Exeter, and now followed largely elsewhere, by means of which the solids are allowed to collect in tanks containing twenty-four hours' flow of sewage, and there undergo putrefactive decomposition, with the result that the settled sewage so obtained may be finally purified on fine-grained bacteria beds.

The particular method of applying the settled sewage to these beds has undergone considerable discussion. The original and largely employed method is to fill them, and after they have been standing full and quiescent for about two hours to empty them at not too rapid a pace. It has been proposed, however, to modify this method by the adoption of rotating sprinklers, and it is reported that excellent results have been obtained by these. Whichever method be adopted (and doubtless all are good, according to local circumstances) the final result is that the sewage is effectually purified without the use of chemicals or the daily production of that foul abomination technically known as "sludge."

One of the chief features which calls for attention in connection with these beds is in respect to the arrangements proposed for causing them to work automatically. It is not necessary here to refer further to the different schemes than to mention the most prominent, viz., those of Mr. Cameron, Mr. Adams, and Messrs. Mather and Platt, and many others, whilst modification of the sprinklers commonly used in breweries and for watering gardens seem to be doing good work, as already mentioned.

Amongst the first considerations to be borne in mind in regard to all new schemes or modifications of old ones are the requirements of the Local Government Board. It has for long past been the fashion to decry the action of this Board, and the authors do not pretend that some of their requirements may not be open to criticism; but whilst this may or may not be the case, it is, under present conditions, useless to beat the air with vain regrets. The only thing which may be usefully considered is the best way of complying with the conditions laid down by the Board, which, rightly or wrongly, is the governing Authority whose decisions must be obeyed.

These requirements are, shortly, that provision must be made in all new schemes submitted for their approval, for the treatment of storm water up to five times the normal dry-weather flow of the sewage; that, according to circumstances, during rain periods, either two or three times the normal dry weather flow must be treated as if it was all normal sewage, the remainder up to the total volume of six times the normal flow being separately treated as storm water; and that provision must also be made for treating all bacterial effluents, however obtained, on land, at the rate of one acre for each 30,000 gallons of liquid, except in the case of storm water, which may be put on land at the rate of 500 gallons per yard superficial.

When commencing the consideration of a new scheme the first points to ascertain are the essential features in regard to quantity of sewage; possibility of carrying the sewage to the outfall works by gravitation, or necessity for pumping, land available, character of the sewage, and suitability for treatment by any particular method, the quantity and nature of any manufacturing waste liquors to be admitted into the sewers.

In many cases this latter consideration will have but little weight, but in others it becomes a very serious question. For instance, it may be proposed to initiate a scheme for a small town or village, in which there is a large or comparatively large, factory producing foul waste liquors equal to four or five times the volume of sewage produced by the whole of the population draining into the scheme. In such a case it may fairly be argued that the extra burden which would be thrown upon the ratepayers by the inclusion of such a volume of foul water into the scheme is unjust, and that the manufacturers should bear the cost of its purification, especially as it has to be borne in mind that when once the Local Authorities have consented to receive this liquor into their sewers they will be unable to rid themselves of the burden, no matter what may be the difficulty and cost experienced in its purification at their works.

In certain cases where the nature and extent of the polluting trade refuse is not of an undue character and admittedly is not of an increasing quantity beyond the normal increase of the population, there will be no objection to admitting it into the system. Gasworks refuse liquor, for instance, generally bears a definite ratio to the normal volume of sewage, and when diluted to that extent no objection is taken to its presence therein, but in those cases where the manufacturing refuse liquor exceeds either by reason of quality or quantity the sewage proper, or forms an unduly large part thereof, it should not be received unless under special circumstances, and with a clear understanding on the part of all concerned.

One of the most difficult problems in connection with the question of the admission of trade refuse into sewers is that in regard to the effect on an industry by reason of the too heavy burden imposed by the cost of a suitable scheme for purifying the liquid in question which the owners of the factory are entitled by prescriptive right to turn into a stream. This is one of those points which require all the knowledge, tact, and patience of all concerned. Factory owners are quite as much alive to the pollution caused by the refuse from the factory as any River Inspector, but they have also to bear in mind the other side of the question, viz., the far-reaching effect of the work going on in the factory, the number of mouths fed by the distribution of the weekly wages, as well as many similar economic considerations. Many such difficulties have been successfully met, and many more will be gradually overcome in time, but one of the worst methods of settling or rather unsettling the difficulty, is to rush into law suits before exhausting all other methods.

With regard to the legal aspect of the question, it is provided by Sect. 7 of the Rivers Pollution Prevention Act, 1876, that "every Sanitary Authority having sewers under their control shall give facilities for enabling manufacturers within their district to carry the liquids proceeding from their factories or manufacturing processes into such sewers, provided that this section shall not extend to compel any Sanitary or other Local Authority to admit into their sewers any

* Paper read at the Conference of Municipal and County Engineers, Building Trades Exhibition, Agricultural Hall, April 26th, 1901.

liquid which would prejudicially affect such sewers or the disposal by sale, application to land or otherwise of the sewage matter conveyed along such sewers or which would, from its temperature or otherwise be injurious from a sanitary point of view. Provided also that no Sanitary Authority shall be required to give such facilities as aforesaid where the sewers of such Authority are only sufficient for the requirements of their district, nor where such facilities would interfere with any order of any court of competent jurisdiction respecting the sewage of such Authority."

It may be observed that in the first clause of the section it is suggested that although the word "shall" is peremptory, the learned editor of "Lumley's Public Health Acts" suggests that the Authority must have some discretion in the matter, and that they will doubtless be entitled to require some payment for the facility and to impose conditions and regulations as to the communications to be made with the sewers.

The provisions of Sections 16 and 17 of the Public Health Acts Amendment Act, 1890, bear on the admission of injurious matter into sewers, Section 16 providing that, "It shall not be lawful for any person to throw or suffer to be thrown or to pass into any sewer of a Local Authority or any drain communicating therewith any matter or substance by which the free flow of sewage or surface or storm water may be interfered with, or by which any such sewer or drain may be injured—penalty for contravention £10, and daily penalty of 20s.; and Sec. 17 enacts that "every person who turns or permits to enter into any sewer of a Local Authority or any drain communicating therewith (*a*) any chemical refuse (*b*) any waste steam, condensing water, heated water, or other liquid (such water or other liquid being of a higher temperature than 110 deg. Fah.) which either alone or in combination with sewage causes a nuisance or is dangerous to health, shall be liable to a penalty not exceeding £10, and to a daily penalty not exceeding £5. The Local Authority by any of their officers, either generally or specially authorised in that behalf in writing, may enter any premises for the purpose of examining whether the provisions of this section are being contravened, and a justice's order may be obtained if admission be refused. A person is not liable to a penalty for an offence under this section until the Local Authority have given him notice of the provision of this section. In other words, the Local Authority must give notice to an offender, and wait seven days to see if the necessary steps are taken to stop the cause of the complaint.

Under the Rivers Pollution Prevention Act, 1876, Sec. 8, the duty of instituting proceedings for pollution of streams was vested in Sanitary Authorities, but as such Authorities were generally the chief offenders, the Act was practically a dead letter until the Local Government Act, 1888, came into force, which invested County Councils with power to enforce the provisions of the Act as regards pollution. Many of such County Councils have also obtained additional power in Acts promoted by them, and Rivers Conservancy Boards have also been created, which have obtained stringent powers by Act of Parliament to restrain the pollution of streams. Section 17 of the Public Health Act, 1875, prohibits Local Authorities from discharging unpurified sewage into streams, and Section 69 of the same Act provides for Local Authorities taking proceedings for pollution of streams where such pollution is caused by sewage, but not by manufacturing effluents.

The following cases decided in the superior Courts may be usefully cited with regard to the admission of trade refuse into sewers:—

Drainage of manufacturing premises: Cutting off communication with sewers: Injunction: Public Health Act, 1875, Section 21.—In Eastwood Brothers, Limited, *v.* Henley Urban District Council (Chancery Division—Mr. Justice Byrne, April 9th, 1900) the plaintiffs, who were woollen and worsted manufacturers, sought an injunction to prevent the Council from cutting-off the connection between the drain receiving the liquids proceeding from the plaintiffs' mills and the public sewers. The injunction asked for was granted. Mr. Justice Byrne, in giving judgment, said: The plaintiffs' predecessors in title had a right to cause their drain to empty into the sewer of the Local Authority, and the plaintiffs have a right to continue so to cause their drain to empty into the same sewer, under Sec. 21 of the Public Health Act, 1875. Having regard to the circumstances under which the connection of the plaintiffs' drain with the defendants' sewer was originally made, and to the length of time during which the state of things so initiated has continued, I am of opinion that I ought to hold, as I do, that the connection was duly and lawfully made. The plaintiffs' predecessors were, and they now are, entitled to empty through their drain, into the sewer in question, not merely sewage matter, but manufacturing effluents—see Peebles *v.* Oswaldwistle Urban District Council, 1897, 1 Q.B., 384, which was reversed, but not on any point material to the present case. Under these circumstances the plaintiffs are, in my judgment, entitled to an injunction to restrain the defendants from cutting off, as they threatened to do, the communication between the plaintiffs' drain and the defendants' sewer—see, among other cases, Attorney-General *v.* Clerkenwell Vestry, 1891, 3 Chap., 527, and the cases there cited. Having regard to the provisions of Section 16 of the Rivers Pollution Prevention Act, 1876, I do not think that Section 7 of the Act gives power to the defendants to stop up the communication in question, even if it had been proved beyond question (as it has not, in fact, been proved) that the liquid discharged from the drain into the sewer would prejudicially affect the disposal by application to land or otherwise of the sewage matter conveyed along the sewer. The defendants may or may not be entitled to some other remedy against the plaintiffs in respect of the effluent discharged into the sewer. I express no opinion upon the point, which does not arise in this action, but I am of opinion that the plaintiffs are entitled to an injunction to restrain interruption of the communication of the drain with sewer. (See report in the *Surveyor*, April 27th, 1900, page 457.)

Sewage disposal: Effluents from tannery: Rivers Pollution Prevention Act, 1876, *Sec.* 7.—In the Attorney-General and Sevenoaks Urban District Council *v.* Whitmore (Queen's Bench Division, Mr. Justice Matthew sitting with an Assessor, Mr. Baldwin Latham, C.E., July 24th, 1900), the Court had to decide between two sets of expert witnesses. The defendants were the owners of a tannery in the parish of Edenbridge, and the Council claimed an injunction to restrain them from causing or permitting the effluents from their tannery to flow into the sewers of the Council, on the ground that the effluents were of so offensive and dangerous a character that they caused the effluent flowing from the Council's sewage farm into the river Eden to be a nuisance to, and injurious to the health of, the inhabitants of the parish of Edenbridge and the persons living near the river Eden. The defendants contended that the Council were bound to continue the admission into their sewers of the effluents from the tannery, and that the nuisance, if any, was caused by the inefficient state and unskilful management of the sewage farm; and they alleged that the tannery effluents were as capable of being dealt with by bacterial treatment as ordinary sewage, if the sewage farm were properly managed. The Council further contended that the tannery effluents contained free alkalinity to an extent which rendered them a liquid which would "prejudicially affect the application to land" of the sewage matter conveyed along their sewers, within the meaning of Section 7 of the Rivers Pollution Act, 1876 (39 and 40 Vic., C. 75),

and that consequently they were not compelled to receive such effluents into their sewers. It appeared that in 1875, when the Local Authority constructed a system of sewers leading to settling tanks and thence into the river Eden, the defendants had received a notice requiring them to connect their tannery with the sewers of the Local Authority, which they had done. In 1886 the present system of sewerage was constructed; and before connecting themselves with the new system the defendants, at the request and under the supervision of the sanitary authority, erected settling tanks on their own premises. Upon the completion of this work the Sanitary Authority agreed to admit and admitted the tannery effluents into their sewers. Dr. Voelcker and Mr. Thudichum were called on behalf of the Council, and stated that in their opinion the tannery effluent contained alkalinity to so great a degree that a liquid resulted which prejudicially affected the application to land of the sewage matters conveyed by the plaintiffs' sewers.

Mr. Strachan, Mr. Frank Scudder, and Mr. Santo Crimp, who were witnesses for the defendants, were of opinion that the effluent of the tannery, in which no chemicals other than vegetable acids and lime were used in no way prejudicially affected the application of the sewage to land, inasmuch as a considerable quantity of the free alkalinity was reduced by carbonic acid from the household sewage in the plaintiffs' sewers and the settling tanks at the sewage farm. They also considered that, owing to the sewage farm being on a clay soil and underdrained, the sewage matter found its way through the cracks in the soil into the underdrains, unaffected by the bacteria on the surface, and so passed in its crude state into the river. The assessor, Mr. Baldwin Latham, having made a report to the learned judge, his Lordship, in delivering judgment, stated that he was not convinced by the evidence given on behalf of the plaintiffs that he relied and acted upon the evidence of the witnesses for the defendants. He gave judgment for the defendants, with costs.

(See report in the *Surveyor*, August 10th, 1900, page 178.)

In Southall Norwood Urban District Council *v.* Middlesex County Council, January 21st, 1901, Q.B.D., 65, J.P., 215, the appellants had been ordered by justices acting in and for the petty sessional division of Brentford in Middlesex to discontinue the flow or passage of offensive or injurious matter from their farm or works into the river Brent. The respondents, the Middlesex County Council, had instituted proceedings before the magistrates in respect to their having caused and suffered sewage and other offensive and injurious matter to pass from their farms into the river. It appeared that in 1894 the predecessors in title of the Council having been required to grant facilities for carrying the liquids and effluents from a margarine factory in their district into their sewers, entered into an agreement to receive such liquids on condition that the owner of the factory should erect and maintain in good working order at his own expense, to the reasonable satisfaction of the Board, on his own land, settling tanks for the purpose of extracting so far as might be practicable all solids, fat, or fatty matters in suspension from the said liquids and effluents.

The appellants in 1898 referred to arbitration the question as to whether the settling tanks were sufficient, and some alterations were required to be carried out as from and by the award of the arbitrator. Notwithstanding this, however, the liquids and effluent discharged from the factory contained so much solid and fatty matter which was objectionable and difficult to treat, and which liquids and effluents when mixed with the sewage in the appellants' sewers rendered it difficult for the appellants to effectually purify the sewage, the effect of which was to so clog the land in the appellants' farm that it became saturated with sewage and rendered the farm unable to effectually filter the sewage from the appellants' district. The Middlesex County Council gave the appellants notice under their Act of 1898 to discontinue the flow of sewage into the river Brent, and the appellants contended that they had not under the circumstances stated, caused, or suffered sewage or other offensive or injurious matter to flow or pass into the said river within the meaning of Section 13 of the Middlesex County Council Act, 1898. The Court (Phillimore and Bruce, J.J.) held that it was the appellants who caused or suffered to pass or flow sewage or other injurious matter into the river within Sec. 13 of the said Act. Phillimore, J., said, "I rest my judgment upon this: having taken over this place from their predecessors in title, the Council collect the sewage on this place, treat it and discharge it through an effluent, and *primâ facie* the Council has to excuse itself from discharging a filthy effluent into the river. The excuse it offers is not sufficient. Either it ought not to have made an improvident contract, or having got a contract, it should see the contract is properly carried out, and either not receive the stuff it is not bound to receive, or take the trouble of enforcing its rights under the award and have the stuff purified; or finally, if it must receive the stuff in its present state, it ought to take other steps on the sewage farm to purify the effluent. I therefore think there must be judgment for the respondents."

These judgments show the danger of admitting factory waste into sewers unless very stringent precautions are taken to ensure their being subjected to preliminary efficient treatment. Once they are admitted, the responsibility for their purification rests upon the Local Authority concerned. As will be seen from the cases cited, the question becomes one of conflicting evidence with the result of a judgment which may or may not be based on facts of the case. It will be of the greatest interest to hear of any definite instance of the effectual purification of a caustic alkaline liquid by means of land treatment.

The lesson to be derived from these facts is most important at the present time, when Local Authorities are being so generally required by manufacturers to admit their factory wastes into their public sewers, and it is on this account, and also because it has been to a considerable extent neglected, that we have dealt somewhat fully on this side of the question, and suggest that Local Authorities should be careful to safeguard themselves, so far as possible, in the first instance before agreeing to the admission of liquids such as those in question into the sewers.

Stockton.—Dr. W. H. Blandford, the Medical Officer of Health to the Stockton District Council, has just issued his annual report on the health of the district. In it he regrets that the death roll has increased from 13·9 per thousand in 1899 to 15·5 per thousand. The doctor remarks that there has been a steady increase in the death-rate since 1896, and commenting upon this he says:—"It may be caused by the large influx of the population into the populous parts of the district where buildings are being rapidly erected, without streets being completed, and all in a state of transition, to a little overcrowding, to a want of cleanliness in the people and their homes; also careless scavenging and the lack of careful and systematic inspection. The deaths in young children have very seriously increased throughout the district, and in Billingham district, out of eighty-one deaths, fifty-one were in children under five years of age, or 62·9 per cent. of the whole deaths. A large number of children died just immediately after birth. This I very much regret, as it shows a want of health in the parents. The high infantile death-rate in certain sections of the population is in a very great measure preventable, and I believe if every care and attention were given these fragile lives many might be saved.

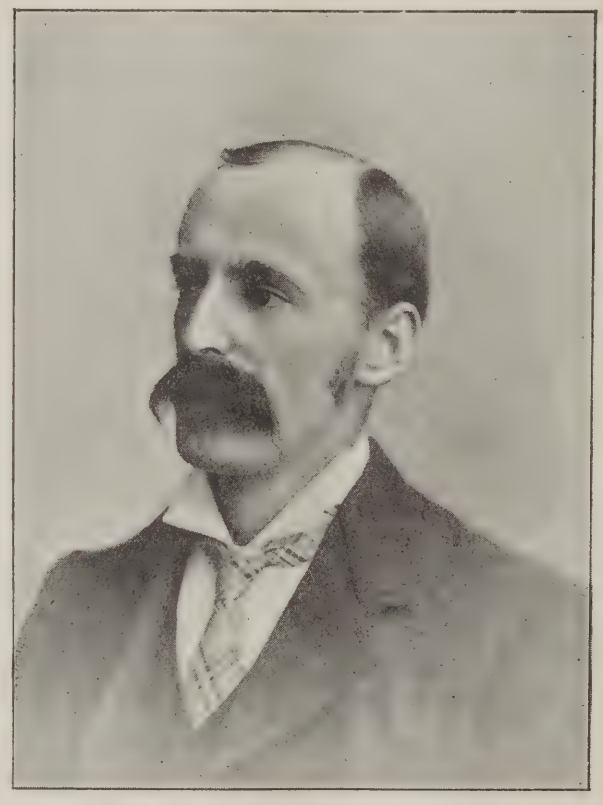
Coming Municipal Men.

XX.—MR. GEO. BALL, Assoc. M. Inst. C.E.,

Engineer & Surveyor, Bexhill Urban District Council.

The subject of the present article, after serving a regular term of articles under the firm of Messrs. Hunter and Carr, Architects and Surveyors, Middlesbrough, entered the office of the late Mr. David Petch, Architect and Surveyor, Scarborough, as chief assistant, which position he held for six years. During that time he designed and carried out many important residences, hotels, and schools, and laid out building estates, new roads, and sewers.

Having a desire to follow more closely the works appertaining to sanitary engineering, he applied for the position of assistant in the Borough Engineer's office, Scarborough (under the late Mr. Joseph Petch, C.E.), and was appointed out of many applications. In due course he succeeded to the position as Deputy Borough Engineer, under the present Borough Engineer, Mr. W. S. Smith, Assoc. M. Inst. C.E.



MR. GEO. BALL.

During the fourteen years Mr. Ball held this position he was engaged in the more important works of municipal and sanitary engineering, including several sections of the main sewerage scheme of the borough, including over a mile of outfall sewers, 5ft. diameter, with sea defence works, costing over £6900, in addition to the laying out of 600 acres of building estate, the property of the Corporation, the erection of public lavatories and conveniences, a new hospital (small-pox), and sea defence works. He also assisted in preparing a scheme for a marine drive and sea wall (1200 yards long), drainage and laying out the undercliff and gardens, at a cost of over £50,000, and prepared the parliamentary plans for the extension of this scheme round the Headland to the junction of the South Parade, at an estimated cost of £70,000. These works are now in progress, and, when completed, will form a marine drive about 2¼ miles in length, connecting the north and south bays of the town. A further improvement, carried out from the designs of Mr. Ball, was the effectual securing of about 2½ acres of very precipitous and sliding cliffs, by constructing a heavy retaining wall at the base, with concrete groynes and deep underdraining, with rubbish abutments and embankments, laying out paths, erections of shelters, lavatories, and public conveniences, in the undercliff. This was a very difficult undertaking, what appeared a huge shipping and wasting cliff, about 150ft. above sea-level, was converted into a "Garden by the Sea."

Other work of some importance was the widening and improving the gradients of the main approaches into the town, what were mere country lanes were formed into main roads, 50ft. and others 75ft. in width. The expenditure on these works was upwards of £20,000.

In June, 1897, he was selected out of 160 applications for the position of Engineer and Surveyor to the Bexhill Urban District Council, and since that period the town has grown probably more rapidly than any other health resort round the coast, the population having increased from 1891 (5026), 1900 (12,340).

Many building estates have consequently been laid out and developed, which means a very large amount of work in the Surveyor's department.

During the past four years contracts have been carried out for £20,000 in private street works, and ten others are in hand. Mr. Ball has laid out a new cemetery, costing over £3300; a new sewage scheme, consisting of 4½ miles of pipe sewers, varying from 24in. to 9in. diam., with sewage lift and storm-water overflow of cast iron pipes 3ft. diameter, towards low-water mark, at a cost of over £9500; new public urinals and plans for underground lavatories, road improvements, and greatly improved the main roads and district roads, of which there are over thirty-six miles. Many miles of paving, caused by the installation of the electric light in the town, have had to be reinstated, and Mr. Ball is now engaged on a scheme for the widening and improving of nearly three miles of highways. Also a marine promenade, carriage drives, laying out and improving about 12½ acres of land for a Public Park and Recreation Grounds.

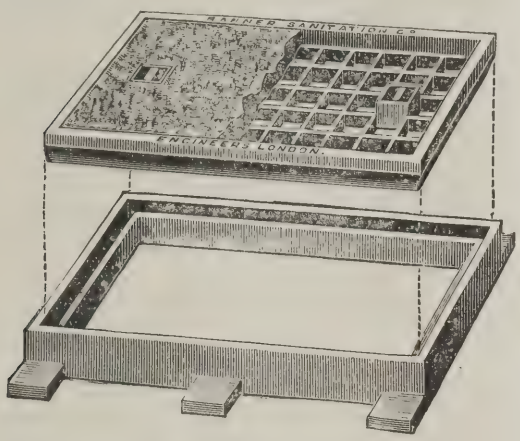
In March, 1895, he was elected an Assoc. M. Inst. C.E., and in October, 1886, he successfully passed the examination of the Incorporated Association of Municipal and County Engineers and Surveyors, qualifying as a graduate, being admitted a member of the Association in 1897.

The Loughborough Town Council has resolved that application be made to the Local Government Board for its sanction to the raising of loans for the several purposes and to the amounts following, that is to say: Purchase of land for sanitary depôt, Allsopp's-lane, Nottingham-road, £250; road construction, Granby-street, extension of Frederick-street, £186; street making and sewerage, Meadow-lane, £613 7s.; kerbing, Forest-road, Emmanuel Church to the Woodbrook, £118; flagging, Nottingham-road, £189 3s.; flagging, Baxter-gate, £251 11s.; flagging, Market-place, £230 15s.; flagging, Devonshire-square, £179 14s. 6d.; street improvement, raising of road for flood prevention, Forest-road, £481 9s. 6d.; total, £2500.

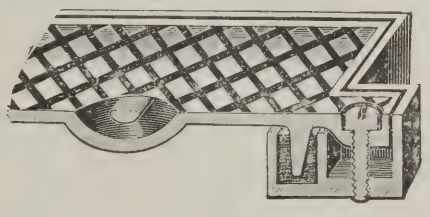
BUILDING TRADES EXHIBITION.

[Second Notice.]

Drainage appliances and the metallic woven stair treads are exhibited by the Banner Sanitation Company, of Craven-street, Strand. Our attention was called to the rustless cast iron air-tight covers and frames for manholes, cesspools, wells, and rainwater tanks, which are also prepared for concrete or tile fittings, as shown with

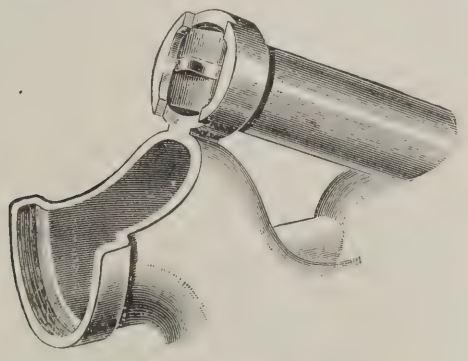


lugs for keying to concrete or tar paving. The next illustration gives a very safe and simple method of locking covers to frames. The gun-metal screw bolts being outside the seal, all danger from drain air passing



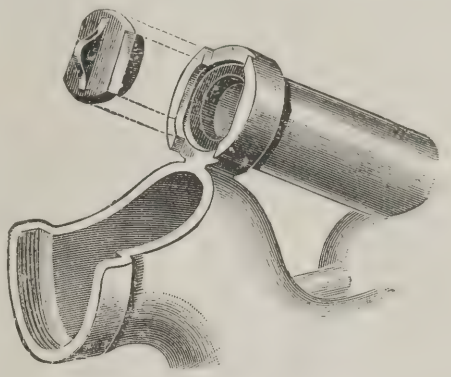
through bolt holes is avoided, as will be seen on glancing at the section of locking arrangement. The only change in Banner's Self-acting "rapid" drain testers is that for glass a metal tube has been substituted. The "Volcano" smoke machine was on view, and its principle described once again.

"B.P." at a distance recalls the hero of Mafeking, but on close acquaintance the "B.P." of Messrs. John Knowles and Co. has really to do with the patent "back-pressure" safety stopper. There were many features on the



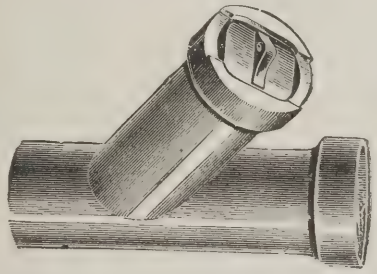
B.P. Stopper in situ.

stand, but the "B.P." we hasten to describe and illustrate for the benefit of all and sundry in the sanitary world. In ordinary practice the ordinary bitumen-lined stopper, as applied to interceptors, is liable to be forced out by the back pressure of gas or sewage, and when the stopper is forced out it drops into the trap and blocks the drain. The illustrations depict a change, and the "B.P." stopper will commend itself to experts for general use in



B.P. Stopper Removed.

inspection eyes, cleansing arms, and branch connections of main sewers. This stopper is recommended to civil engineers in the construction of main drainage schemes. As a matter of fact various devices have been resorted to by engineers to make an effective temporary stopper in the junction arms which are laid at intervals in the



B.P. Stopper Applied to Junction for Prospective Use.

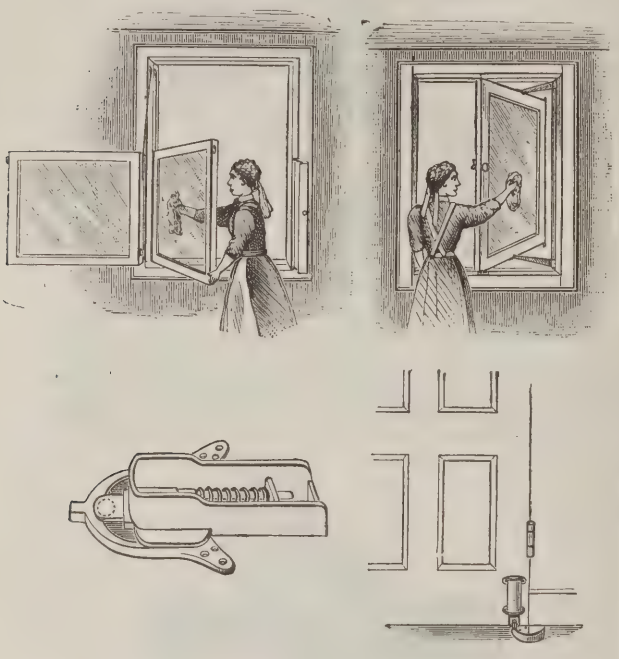
main drain, for the purpose of subsequent house connections. But these devices have been more or less unsatisfactory. The use of the "B.P." stopper will change this, and prevent any nuisance. It has the great advantage of being easily removed, and the pipe from the house drain inserted, without the slighest disturbance of the drain. It can be supplied for a purpose of this kind at almost the same price as the ordinary bitumen-lined stopper.

Mintons, of Farringdon-avenue, have a neat arrangement for the display of wall tiles. In one section are bird panels, with raised outline and painted in coloured glasses, after Leon V. Solon, displaying excellent work. Then their panels of fish, and pheasant, and partridge by Wright; and figure panels in slight relief L. V. Solon. This is a charming salon by itself.

Wire wall ties and flat wire ties were exhibited by the "Warrington" Bond-Iron Syndicate (of Brewery-street, Manchester). We examined specimens of the cavity and solid ties, and came to the conclusion that, properly placed, they would be immovable. It is not necessary to cut or chip bricks, as the tie can be bent to fit into the course. These bond-irons appear to be in general use in England, Wales, and Scotland.

Models are greatly in evidence at Islington, and Mr. J. C. Moore (secretary of Moore's Patents Company) provides several, which we illustrate. When windows are fitted with the patent vertical sliding sash the servant is safe. When the sashes are at the bottom they are always hinged, but the person inside can by moving a handle turn them inside to paint, repair, or clean the outside, and then replace them as easily as an ordinary door is opened and closed, without steps, poles,

or risk of accident. By moving a catch in the inside of a casement window with the finger when the sash is open, the outside will turn inside for cleaning. Another novelty is Moore's two-way door spring and hinge. They are screwed on the floor, without cutting a hole for them, and on the bottom of the door. They have a screw adjustment—operated by an ordinary turn-screw or screw-driver without removing anything — to suit



them to heavy or light doors, and the bearing part runs in oil. The door will stand full open or will close gently, and when closed no draught will open it. The one-way door springs are screwed in a vertical position near the bottom hinge on an ordinary hinged door. These novelties cannot be too widely known.

An American firm, the Standard Sanitary Manufacturing Company, of Pittsburg, and 22, Holborn-viaduct, exhibit a fine display of baths, lavatories, and w.c. seats. These finely finished appliances well repaid inspection, and although the firm is new to us, the excellence of their wares is such that we feel certain they have "come to stay."

Mr. Walter E. Mason (late A. Mason and Sons), of Horwich, had an attractive collection of sanitary specialities on view. Mr. Mason makes enamelled fireclay ware, and specimens of his handiwork were to be seen in the basins, ranges, closets, tanks, cisterns, and sinks exhibited. The baths were well finished, and the examples of decorative marbling were greatly admired. The full-size working models of urinals, lavatories, and closets were quite a feature in Mr. Mason's display, and no doubt proved "a lesson without words" to many of the visitors.

The Westminster Sanitary Works occupy a large space, and have placed their specialities to the best advantage. Messrs. Davis and Bennett have partitioned off their mosaic floors and tiled wall linings from lavatory ranges in marble or porcelain. The marble and porcelain safes for closets and baths are attractively shown, as well as their special cast iron drainage fittings.

A model of the handsome arched doorway in tawny terra-cotta to 11, York-street, W., now in course of erection, was quite an effective feature in the space occupied by Messrs. Joseph Cliff and Sons, of London and Leeds. The stand was tastefully arranged, and artistic vases, in which palms rested, were disposed in different parts to the best advantage. The firm manage to intersperse their imperial porcelain baths, sinks, and lavatories, with patent hanging tiles, "dovetailed-keyed" bricks, majolica fireplace, and Grip patent wall tiles. Tiltman's patent partition bricks and scum troughs for swimming baths attracted considerable attention.

Cellar flaps and coal plates are a speciality of the St. Pancras Ironworks Company. We lifted one of the flaps with ease, but the other was beyond our strength or skill. Their prismatic and other pavement lights are a feature which should not escape the notice of contractors, who wish to shed light in American darkness. The models of forge works would attract artistic blacksmiths; and the models of staircases would not be overlooked by perplexed architects.

Sanitary ware was tastefully shown in the corner space of the third row by Messrs. Broad and Co., of Paddington. Specialities of various kinds were on view, and the manner in which the bends, pipes, channels, gully traps, manhole covers, and bricks were displayed, commanded the admiration of the visitor. Manhole chambers fitted up with white enamel channels, &c., were inspected; and also tiles in various colours and patterns for wall work. We also noted specially the adamantine clinkers and channels for stable paving, as being exceedingly useful, while the encaustic and paving tiles for floor work caught our eye. The patent scullery sink is made in white enamel and cone-glazed stoneware. In this sink the ordinary grating is replaced by a deep perforated cup, made of stout tinned copper, into which tea leaves and other solid matters fall, and are at once intercepted without choking the outlet, which is furnished with brass grating as a further precaution against solids passing into the waste pipe. The copper strainer is loose, it can be lifted out and emptied as required. This sink should please housewives.

The Midland Stoneware Pipe Co. (of which Mr. F. H. Brook is managing director) had a small but representative exhibit of sanitary pipes, chimney tops, sewer pipes and bricks, gullies, syphons, &c. Mr. Brook also exhibited specimens of the manufactures of other houses for whom he is sole agent in London, such as John Carr and Sons, Lumley Brick Company, Wm. Mobberley, and the Sussex Brick Company.

Mr. Peter Wood, of West Bromwich, exhibited samples of the famous annealed blue bricks, including plinths, bull-noses, sploys, and pavings of every description. The manner in which various specialities were arranged left nothing to be desired.

Messrs. S. and E. Collier, of Reading, had a nicely-decorated stand, the red ware drain pipes being quite a feature. The entrance to an imaginary house at once showed the uses to which the bricks, garden edging tiles, roofing and wall tiles, finials, and other specialities could be applied. The terra-cotta designs were very pretty, and the mural tiles and panels exeedingly attractive. Altogether this stand provided a veritable object lesson to builders, sanitarians, and architects.

The introduction of daylight into dark buildings may be obtained by adopting electro-glazed Luxfer prisms. That is the claim made by the British Luxfer Prism Syndicate (of Hill-street, Finsbury), and in their attractive stand they put it to the proof. Specimens were shown of Luxfer rolled prismatic glass in various angles in sheets, and electro-glazed for warehouses and factories; and for canopies and skylights. The samples of best glass for decoration work and fire screens were very fine; while pavement lights, cellar flaps, and rolling lights were all displayed. The syndicate also make a very nice show in the fire-prevention section with their fire-resisting clear glass and Luxfer prisms. This stand attracted much attention.

(*To be continued.*)

NUISANCES AND METHODS OF INSPECTION.[1]

By J. Spottiswoode Cameron, M.B., B.Sc., M.O.H. Leeds.

NUISANCES AND INSANITARY CONDITIONS.

(*Continued from page* 353.)

The Public Health (Scotland) Act, 1867, is somewhat more precise in its definitions of a nuisance, and will require separate study by those holding or intending to hold appointments in Scotland.

In the 47th Section of the 1875 Act (which is a re-enactment of the first and second clauses of the 59th Section of the Public Health Act, 1848) certain offences are punishable by fine and cumulative penalty if committed or allowed to occur within an urban district. They are three, and may be remembered by the letter "s," "swine," "stagnant," "soakage."[7] The Section runs as follows:—"Any person who in any urban district (1) keeps any swine or pigstye in any dwelling-house, or so as to be a nuisance to any person; or (2) suffers any waste or stagnant water to remain in any cellar or place within any dwelling-house for twenty-four hours after written notice to him from the Urban Authority to remove the same; or (3) allows the contents of any water-closet, privy, or cesspool to overflow or soak therefrom, shall," &c.

Offences against any of these three Sub-sections are punishable in each case by a penalty not exceeding 40s., and a further penalty not exceeding 5s. a day if the offence is continued, and the law not permits but requires the Urban Authority to abate or cause to be abated every such nuisance and enables it to recover the expenses of so doing.[8]

While, therefore, the question of injury to health is the great moving power in the Public Health Act, it is not always necessary to prove that the nuisance complained of has actually caused injury to health. In the Section just quoted (47) "any swine or pigstye so kept as to be a nuisance" must be dealt with by the Authority. But it is only the Urban Authority which is thus compelled to deal promptly with the nuisance apart from the question of injury to health. In the 91st Section (the third "p") the animal must have been kept so as to be a nuisance or injurious to health.

At first sight it might appear that the word "or" implies an alternative, viz., a thing that is a nuisance, whether injurious to health or not, and (2) a thing which is injurious to health. But such is not quite the meaning assigned by the Courts to the words used in the Section. These words are the same as those employed in the Nuisance Removal Act of 1855.[9] Under this Act it was held, in an action by the Great Western Railway Company against Bishop, that a nuisance which was created upon a highway by water percolating through the railway bridge and dropping on to the road beneath was not "a nuisance or injurious to health," because that expression was to be read in the sense of a nuisance injurious to health.

This decision was subsequently explained by Justice Stephen. His definition of the words "a nuisance or injurious to health" was as follows:—"Anything that would diminish the comfort of life, though not injurious to health, and anything which would, in fact, injure the health." And he explained that in the previous case the Court abstained from bringing within the purview of the Nuisance Removal Act a nuisance of an entirely different kind from the nuisance the legislative intended to deal with.

I pause here to remind you again that all the three "p's," "premises," "pools," "pigs," in Section 91 of the 1875 Act have to be "nuisances or injurious to health," and that the same is true of the fourth sub-section,[10] accumulations; while the fifth Sub-section deals with overcrowding only when it is dangerous or injurious to health. In the sixth, vapours and dust have to be "a nuisance or injurious to" health, and the overcrowding has to be "dangerous or injurious to health."

Pigs seem to have been a constant source of trouble to the community. We saw earlier that Blackstone specially instances them amongst his list of nuisances, that the Public Health Act, 1848,[11] specially required their removal, when a nuisance, in towns, and when within town dwellings, even without the proof of a nuisance, and that the Nuisance Removal Act, 1855, enabled Authorities to deal with these animals anywhere if "a nuisance or injurious to health," or according to Mr. Justice Stephens, in such a state as to "diminish the comfort of life, even though not injurious to health."

Diminishing the comfort of life implies, perhaps, a considerable amount of annoyance, not probably such an inconvenience as would be suffered by a man passing half a field's length from a pigstye once a week on his way to business. Such could scarcely be said seriously to "diminish the comfort of his life." It is, therefore, necessary, in considering nuisances which cannot be dealt with as naturally or absolutely injurious to health, to take into account the degree of annoyance they are likely to occasion. A manure heap, for instance, against your garden wall might greatly interfere with your comfort and enjoyment of life, but a reasonable amount of manure placed upon a field and rapidly covered in might be considered by the Court as coming under the first proviso of the 91st Section as "an accumulation or deposit not kept longer than was necessary for the purposes of business or manufacture."[12] The distance from any dwelling or thoroughfare at which any accumulation was retained, and its size and the length of time for which it remained would enter into the calculation as to the degree of annoyance suffered by the community.

For it must be remembered that it is the duty of all public sanitary officials to protect the public health with the smallest amount of harassment to private interests. The public health must be their first consideration, but they must "do their spiriting gently." Shylock remarks: "You take my life when you do take the means whereby I live," and we must remember, even in guarding the public interest, that we must be careful not to destroy those trades and industries whereby people live. Hence there is need of judgment on the part of the inspector.

Judgment and discretion are especially necessary where the Urban Nuisance Inspector has to take action under the 49th Section of the Public Health Act, 1875.[13] This Section places it entirely at his discretion to serve a twenty-four hours' notice for the removal of a heap of manure, or similar filth, and if the order is not complied with, the Authority may remove, and sell, the same.[14]

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[1] A lecture delivered in the Philosophical Hall, Leeds, April 13th, 1901.

[7] Should you have any objection to the use of the word "soakage" for the catch word for the third Sub-section, you may translate the word cesspool into the Yorkshire word "sump," when the three catch words would be "swine," "stagnant," "sump."

[8] It will be noted that the keeping of swine inside a house, or so as to be a nuisance to anyone, as well as the allowing of the contents of the sump, &c., to overflow is a punishable offence, even where no notice is served by the Authority. Notice must be given of stagnant water.

[9] 18 and 19 Vict. c. 121. Section 8 deals with the three "p's" and the first "c."

[10] Added to definition in Nuisance Removal Act, 1855, by Section 19 of Sanitary Act, 1866, 29 and 30 Vict., c. 90.

[11] Section 59 re-enacted in 1875, Section 47.

[12] This proviso does not prevent the issuing by the inspector of a peremptory notice for removal in an urban district, but it might weigh with the authority in enforcing the abatement under Section 49.

[13] A re-enactment of the 3rd and 4th clauses of the 59th Section of the Public Health Act, 1848.

[14] Much friction may often be avoided by getting the Authority to enforce the 50th Section, by means of which they may prescribe definite periods for the removal of stable and other kinds of refuse.

Such great powers must be administered gently, "'Tis excellent to have a giant's strength, but it is tyrannous to use it like a giant."

Take, for instance, a particular kind of nuisance exciting a good deal of interest at the present time, "the house unfit for human habitation." Such may be dealt with under the Housing of the Working Classes Act, 1890, a consolidation of previous Acts with considerable alteration. Restricting ourselves for the moment to the second part of this Act, it is provided that the Local Authority on a representation being made to them by one of their officers, if satisfied that any dwelling-house appears to them to be "so dangerous or injurious to health as to be unfit for habitation shall forthwith take proceedings against the owner or occupier for closing the dwelling-house under the enactments set out in the third schedule to this Act,"[15] which enactments are, for the provinces, the 91st, 94th, 95th, and 97th Sections of the Public Health Act, 1875.

These are nuisance sections simply, and the action of the Courts in dealing with proceedings taken Under the 97th Section will be watched with considerable interest. For the Act of 1890 goes on[16] to confer powers upon the Authority first to obtain from the magistrate a closing order, which closing order may be accompanied by compensation[17] from the owner to the tenant for disturbance and next, a closing order having been made, and not determined by a subsequent order "the Local Authority, if of opinion that the dwelling has not been rendered fit for human habitation and that the necessary steps are not being taken with all due diligence to render it so fit, and that the continuance of any building being or being part of the dwelling-house is dangerous or injurious to the health of the public, or of the inhabitants of the neighbouring dwelling-houses, shall pass a resolution that it is expedient to order the demolition of the building."[18]

The notice of such resolution is then served[19] upon the owner, who can appear before the Authority and if the Local Authority, having heard him, still consider demolition desirable they can make an order that the house shall be taken down within three months, or in default, do the work themselves.[20] There is, of course, an appeal to Quarter Sessions against the order for demolition.

One very important point—and it is a point the Authority in considering the question of demolition would have to take into account—would be whether or not the house was capable of being made habitable. Here one can see much conflict of testimony in the future. In regard to houses damp, delapidated, badly drained, there can be generally little or no doubt as to whether they are fit or unfit for habitation, but often these evils can be remedied.

If, however, the house in the opinion of the owner would not recoup him for the necessary expenditure and he accordingly fails to carry out the needed alterations, the question of demolition would then have to be taken into account. For there can be no doubt that an empty house in a delapidated condition is a source of danger, annoyance, and frequently of injury to the health of the neighbours.

But a still larger question is here opened up. There are houses so situated in such close entries or built of such porous material, that it is quite impossibe, at any cost, to make them fit to live in. These houses there would be no difficulty in most cases about closing, though probably Local Authorities would often hesitate about absolutely abolishing even such property without some compensation.

Especially is this latter difficulty likely to be felt where the house itself, structurally, is not very bad, where it is air-tight, water-tight, fairly free from damp, and where the chief defects are the want of sunlight and the want of fresh air—defects possibly quite as much due to the building of other houses in the neighbourhood, since the dwelling was first erected, as to any fault of the original owner. In such circumstances, it is not likely that Sanitary Authorities would frequently think of destroying houses of this kind without any compensation at all. About their power to do so there does not, however, seem to me to be much doubt, if the houses are at the same time a cause of injury or danger to the neighbourhood. It is perhaps fitter, however, that the Authority should have this power of demolishing without compensation, as it will enable them to treat with extortionate owners on much more favourable terms, and reasonable owners are not likely to be met by an elected body, many of whom are themselves property owners, in an unreasonable spirit.

The two things required for the power to demolish the house, are:—(1) That the house itself should be unhealthy, and (2) That it should be a cause of injury to those who live near. The soil, of course, remains vested in the owner. Provision is, however, made in the same Act for dealing with buildings which are simply obstructive, and in these cases the Authority can give reasonable compensation. The amount is to be settled in case of dispute by an arbitrator appointed by the Local Government Board, who has, if the building be a dwelling-house, to take into account, amongst other things, whether its demolition would not improve other property belonging to the same owner.

A very large number of houses in our great towns belong to the class of those which cannot be made habitable, but even in the slums a great deal can often be done by the removal of the worst offenders, by letting air and light into dark passages and yards, and by attention to the ordinary sanitary requirements of the houses left. It never does to forget that cheap houses have to be provided, and that it is better to live in a house not all that it ought to be than to have no house to live in at all. The rule should be to insist that new buildings come up to a high sanitary standard, and for existing buildings to require the removal of all causes of major nuisance.

(To be continued.)

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15 Section 32.
16 Section 32, "It shall be the duty of every Local Authority if . . . to forthwith take proceedings . . . for closing the dwelling-houses."
17 Section 32 (3).
18 Section 33 (1)
19 Section 33 (2)
20 Section 33 (3) and (4) Section 34.

Kingsbridge.—Dr. W. H. Webb, in his annual report to Kingsbridge Urban District Council, stated there had been 52 births, a birth-rate of 16·6 per 1000, and 69 deaths, equal to 12·5 per 1000. Only one death had occured from zymotic disease, the death-rate being ·3, the lowest possible. The percentage of deaths of children under one year was 11·5, and under five 21. Out of 39 deaths, eight were of persons over 80, the oldest being 89; seven were from consumption, and four from cancer, the same as last year. No death had occurred from influenza, a marked immunity as compared with other rural districts. Altogether the death-rate was the lowest recorded. The birth-rate was 5·6 lower than the average for the past six years. Percentages of deaths in children were extremely satisfactory. During the year only one notification had been received of the existence of infectious diseases in the district, the case being one of erysipelas. What he might term the total absence of any notifiable infectious disease in the whole district was remarkable. During the present and past year here had been only one case of typhoid fever in the district, a fact which pointed out the great value of the attention which the sewers were now receiving, and also the wisdom of enforcing proper traps and connections to various tenements.

INSTITUTION OF CIVIL ENGINEERS.

THE "JAMES FORREST" LECTURE.

On Thursday last a large audience assembled in the Lecture Theatre of the Institution of Civil Engineers to listen to Professor Frank Clowes (chemist to the London County Council) deliver the "James Forrest" lecture. The subject chosen was

"CHEMISTRY IN ITS RELATION TO ENGINEERING."

The introductory portion showed the close connection between the chemist and the engineer, more particularly as invention and discovery advance. The methods of teaching at various colleges and universities were very fully reviewed; also the part chemistry plays in the manufacture of steel. The portions of the lecture of most interest to the municipal engineer were those referring to gas, water, and sewage. On the first of these topics Prof. Clowes said it was scarcely necessary to point out the absolute necessity of chemical knowledge and chemical advice to the gas engineer. The engineer who designs and superintends in use the plant for making the various forms of gaseous fuel which are required for heating and lighting purposes, requires to keep abreast of chemical progress in these departments, and he will be seriously handicapped if he endeavours to proceed unaided and unadvised by the chemist, and if his products are not frequently subjected to chemical examination.

The design and construction of waterworks is pre-eminently an engineering undertaking, and includes not only the provision of suitable borings, conduits, storage reservoirs, and pumping stations, but also of suitable and satisfactory filter beds when necessary. But here, again, if the health and requirements of the consumers of the water supply are to be properly considered, the chemist must determine the character of the water source from which the supply is to be derived. He must ascertain its relative purity during the different seasons, its behaviour in contact with leaden cisterns and service pipes, and the means of preventing any risk of the water becoming poisonous from contact with lead if the supply is soft, or of diminishing or preventing the waste of soap and the formation of boiler scale if the water is hard. He is also charged with the duty of constantly examining the water as it is supplied to consumers, in order to ascertain whether filtration is properly and efficiently carried out, whether the bacteriological condition of the supply is satisfactory, and to make sure that the water does not receive any constant or casual pollution on its way to the consumer. Hence, in the matter of water supply, both the engineer and the chemist find their respective but closely connected spheres of duty.

There is another direction in which the constant relation of chemistry to engineering, and in which the association of the chemist with the engineer must be maintained if success is to be secured and expensive failures are to be avoided. Neither the engineer nor the chemist, alone and unaided, is the proper person to deal with the disposal of the sewage of our towns. In the final stage of designing and constructing and maintaining the necessary works on the large scale, as well as in the construction of works on the earlier experimental scale, the engineer undoubtedly finds his necessary and natural sphere. But it must be remembered that the processes by which the purification of town sewage has been accomplished, and has been from time to time improved, have invariably been evolved, directly or indirectly, by the chemist, and depend on chemical investigation, checked by the results of chemical analysis. It should further be borne in mind that, when any process of treatment has been established on the large scale, the results of its working, as in the parallel cases of gasworks and waterworks, must be constantly checked by chemical examination of the products.

It is not sufficient to pronounce a sewage effluent to be satisfactory because it is clear and inoffensive as it issues from the purification works. When the sewage has been clarified, something has been accomplished it is true, and due credit should be given for the improvement. But it is often only necessary to subject such a clarified effluent to examination by ordinary processes of chemical analysis in order to learn that it is laden with dissolved impurities, which are at the moment invisible to the eye and inappreciable to the sense of smell. When this effluent is exposed for a short time to natural summer temperatures, or to artificial summer heat in the chemist's laboratory, it runs rapidly into foul putridity.

Such an effluent should manifestly not be looked upon as having undergone successful treatment, and should not be admitted into any ordinary watercourse. It will certainly deprive any stream into which it is discharged of its vital dissolved oxygen, and will therefore render fish life impossible. It will probably, either constantly or occasionally, cause the stream itself to become foul, since in the absence of dissolved oxygen these dissolved impurities rapidly undergo putrid changes. The mere examination of such an effluent by the ordinary senses will evidently be entirely misleading, and it is only by the chemical examination of the effluent that its true character will be made known. The frequently repeated chemical examination of effluents is necessary in order to ascertain that their condition is such as will not lead to the creation of nuisance or offence.

The tendency of those in charge of any process of sewage treatment, if they proceed without frequent information from and consultation with the chemist, is to be satisfied with an effluent discharge which is apparently, but not really, of a satisfactory character. When the clear but impure effluent leads to nuisance, the temptation is to proceed to the erection of large and costly plant either for the improvement of the existing process or for the application of some newer method of treatment. This expenditure may be undertaken before the additional plant or the newer method has been tried on a small scale and thoroughly tested under the supervision of the chemist. The expenditure thus incurred may accordingly lead to no good result, and the new venture may prove to be a failure as far as good results of purification are concerned. In the development on the large scale of a scheme of sewage treatment which shall be suitable for any particular centre, the engineer finds one of his most valued and important spheres, but he should undoubtedly associate himself with a chemical adviser in the early experimental stage of testing the suitability of the process; and after the scheme is in operation on the large scale he should secure the advantage of the co-operation of the chemist in constantly examining the true character of the effluent which is being produced, and in ascertaining its effect upon the watercourse into which it is being discharged.

In no application of chemical and engineering principles is the co-operation of chemist and engineer more necessary for the attainment of success than in securing the suitable purification of our town sewage. Such co-operation has enabled London, Manchester, and other large centres of population in recent years to carry out on an experimental scale most important trials of the natural or bacterial treatment of sewage, and has led to reports on this method being published which will probably become classical. This experimental work has led to considerable and valuable development and improvement of the bacterial method. There is now no doubt that this process can inexpensively dispose of a large proportion of the putrescible sediment or sewage sludge, and can render the effluent not only non-putrescible and

suitable for maintaining the life of fish, but even pure if necessary. The process is therefore destined to effect great reforms in our sewage-disposal problem and considerable improvements in the condition of our watercourses.

It should be understood that the purification thus effected is in the true sense of the term "natural." It is brought about by the extremely minute vegetable organisms, known as bacteria, which are present in vast numbers in the sewage itself. The bacteria present in the sewage only require to be placed under suitable conditions in order to exert their extraordinary purifying influence. It is therefore by agencies naturally present in the sewage that it is rendered inoffensive, or even, if necessary, pure. No extraneous artificial substance is added. The direction in which recent improvements are tending for effecting our sewage purification are in the direction of simplication, and are effected by allowing natural processes to have their freest and fullest play, instead of applying artificial mixtures of chemicals.

If the engineer co-operates with the chemist and physiologist by first appreciating and grasping these recent facts of natural treatment and then devising and adapting suitable plant for applying them on the large scale to our town sewage, he will be fulfilling his true function and will be applying the forces of Nature to the advantage of mankind. Manchester at present leads the van in this important movement, since it is constructing bacteria tanks and beds on the large scale; London, Leeds, and many other centres are feeling their way, and the speed with which the system is generally adopted will naturally be largely affected by the interest taken by our Sanitary Authorities in adopting the best methods of sewage purification. By the long and patient experimental investigation of this natural process of treatment results have now been obtained which admit of extended application, and the time has arrived when chemist and engineer may advantageously co-operate in carrying out natural schemes of sewage purification on larger and larger scales.

The lecture was repeated on Friday afternoon.

CONFERENCE ON THE HOUSING QUESTION.

On Monday last a number of representatives of the various Metropolitan Borough Councils—mostly Mayors, Town Clerks, Aldermen, and Councillors—attended in conference at the Islington Town Hall, at the invitation of the Mayor of Islington, to discuss the housing question. The Mayor, who was supported by Sir Albert Rollit, one of the parliamentary representatives of the borough, was himself called upon to preside. He briefly explained the situation in which the Borough Councils were placed by the Housing of the Working Classes Act. It was decided that the conference should confine itself entirely to matters of administration, and should not in any way attempt to interfere in matters with which Parliament was at present concerned.

A long discussion took place on the motion of Alderman Mills, of Islington, calling upon the conference to agree that, as the adoption of a certain section of the Act by the Borough Councils would lead to dual control and possibly to overlooking expenditure, it was desirable that some arrangement should be come to with the London County Council as to the respective spheres of action of that Council and of the Borough Councils. Other matters that were considered by the delegates were the undesirability of obtaining parliamentary powers to displace the working classes without at the same time making such arrangements for rehousing as would satisfy the Council of the borough concerned as well as the Central Authority; the demand for trains that should be run within a radius of twenty miles of London at a maximum return fare of twopence; that loans should be issued to the Local Authorities by the Government, for housing purposes, at a reduced rate of interest; that Borough Councils with land available within their boundaries should set to work to build houses; and that an understanding should be arrived at between the Borough Councils and the County Council as to the part the Borough Councils should take in promoting building schemes outside the County of London.

It was also suggested that, in view of the desirability of simultaneous action by the Borough Councils, the conference should be continued, the future meetings being held at the Town Hall of the city of Westminster, in Charing Cross-road.

THE NATIONAL REGISTRATION OF PLUMBERS.

A meeting of representatives of District Councils for the National Registration of Plumbers was held at the Guildhall on Wednesday week. Belfast, Birmingham, Bradford, Cardiff, Edinburgh, Glasgow, Leeds, Manchester, Nottingham, and Plymouth sent delegates, and reports were presented showing that since the Conference of Health and Water Authorities and Plumbers was held in Birmingham in October last, 2082 operative plumbers and 494 master plumbers had been registered, and that the applications for registration were so numerous that a vast number still remained to be dealt with.

On the motion of Dr. Williams, Medical Officer of Health, Plymouth, it was decided to increase the facilities for the examination of applicants.

Baillie Dick, chairman of the Health Committee, Glasgow, reported that with a view to encouraging the students attending the plumbing classes in the city, arrangements had been made for admitting specimens of their work in the industrial section of the Glasgow International Exhibition.

Various arrangements for securing the more systematic training of plumbers were discussed, and on the motion of Dr. Alfred Hill, Medical Officer of Health, Birmingham, it was resolved that apprenticeship should be encouraged in connection with the National Registration of Plumbers, and a special form of indenture for plumbers' apprentices, framed by the Plumbers' Apprenticeship Board of London, should be circulated for adoption throughout the kingdom.

Mr. Marchbank, Edinburgh, undertook to adapt the form to the requirements of Scotch law.

On the motion of Mr. Jenkins, plumber, of Cardiff, it was resolved to advertise the conditions of registration for persons now engaged in the plumbing trade.

On the motion of Mr. Westley, plumber, of Nottingham, it was resolved to extend the date for receiving these applications.

EXAMINATIONS IN PLUMBERS' WORK.

Examinations in practical workmanship under the Company's Graded Syllabus of Instruction were held on the 27th ult. in London at King's College, for students from Tottenham, Wandsworth, and Willesden; and the Regent-street and Battersea Polytechnics for students attending classes at those institutions; at the Rawlish Technical School, Wimbledon, for students at Wimbledon and Kingston; also at Accrington, Ashton-under Lyne, Brighton, Cheltenham, Chorley, Darlington, Devonport, Dundee, Dunfermline, Garston, Gateshead, Great Yarmouth, Jarrow-on-Tyne, Lancaster, Leeds, Newcastle-on-Tyne, Northampton, North Shields, Plymouth, Southport, South Shields, Swansea, Warrington, West Hartlepool; and an examination at Manchester Technical School for candidates for registration. The examiners were an equal number of master and operative plumbers at each place.

MUNICIPAL ENGINEERING & SURVEYING.

CROSS-TABLE CHAT.

There is some doubt, I believe, as to whether the Sanitary Institute will hold a Congress and Exhibition this year, but that younger and more pushful organisation, the Royal Institute of Public Health, are maturing arrangements for their annual Congress, which is to be held at Eastbourne, under the presidency of his Grace the Duke of Devonshire, from the 25th to the 30th July next. In connection with the Congress there will be a municipal engineering section, of which Mr. Gloyne, the Borough Engineer of Eastbourne, is the hon. secretary, and with his characteristic energy he is leaving no stone unturned to make it a success, and has issued circulars to members of the Association of Municipal Engineers inviting them to attend and to reply to his invitation. Surveyors who are not members of the Association will be admitted to the meetings, and Mr. Gloyne will, I know, gladly give them all the information he can on their writing him. I may assure surveyors who do not know Eastbourne or its people that they will be delighted to make their acquaintance, for Eastbourne is one of the best managed and most attractive of our southern sea-coast watering-places.

Claims for recovery of expenses incurred through extraordinary traffic on public highways are of very frequent occurrence now-a-days, and such claims are made under Sec. 23 of the Highways and Locomotives (Amendment) Act, 1878. It does not appear to be so generally known as should be the case, that this section is amended by Sec. 12 of the Locomotives Act, 1898. Under the former Act, a Local Authority could only recover from the person "by whose order the extraordinary traffic has been conducted," and this was the contractor only. But the Act of 1898 makes the expenses recoverable from the person "by or in consequence of whose order" it is conducted, which means that the Local Authority may now recover from the person who employs the contractors—a very useful provision not only to the advantage of haulage contractors, but also to Local Authorities. As some Local Authorities appear to have suffered in one or two actions through their unacquaintance with the Act of 1898, it is advisable that surveyors should make themselves familiar with it.

The manufacturers of steam motor-vans are continually making improvements to suit the requirements of Local Authorities for their adaptation for use for municipal purposes, such as for street watering, refuse removal, &c., and Messrs. Bayleys, Limited, of Newington-causeway, Southwark, London, are among the most progressive of these. They have just issued some useful circulars descriptive of the classes of motors manufactured by them, along with comparative estimates of the work and cost of same when carried out by a given number of horses and that of a motor-van. While these estimates are open to some criticism, they will be useful to my readers who might obtain copies for the use of their Local Authorities.

The Building Trades Exhibition of 1901, which is held every two years at the Agricultural Hall, closed on Saturday last. I learn that it was in every respect an eminently successful show, and beat all its predecessors. I am not sure that out of all the exhibits there was any one which struck the average municipal engineer as being especially novel or a departure from existing methods. Possibly this is due to the fact that we have arrived at such a high state of perfection in sanitation that further improvements are only possible at considerably increased cost of production, and as the cost of existing apparatus and appliances is as much as those who are called upon to pay will bear, additional departures at increased cost cannot be introduced so as to be profitable from a business point of view. Be that as it may, there was nothing which was especially original.

There were two or three exhibits which I might mention as possibly interesting to municipal engineers, viz., a new process for reproducing architects' and engineers' plans in photography, termed the "new black line process," which is a speciality of Messrs. Norton and Gregory, of 24, Westminster Palace-chambers, Victoria-street, Westminster, S.W., engineers' and architects' photographers. The reproduction is made on ordinary drawing—not special—paper as in the ferro-gallic process, and as the copies thus made are on stout paper and very closely resemble originals, there are scores of engineers who will prefer the new process.

Another object of interest to the draughtsman engineer is an engineer's drawing table, with a drawing-board mounted on a patent rest, which allows the board to be placed at any angle, and also to revolve, so that any part of the board may be brought to the draughtsman, thus avoiding the releasing of the paper from the board, or the draughtsman having to be so frequently altering his position. There is also an attachment at the bottom of the board for holding drawing pins, pencils, rubbers, &c. Both of the apparatus, *i.e.*, the drawing-board rest and the bottom attachment, may be obtained separately. The exhibitor was Mr. John P. White, the Pyghtle Works, Bedford.

One did not fail to notice that numerous firms are introducing materials for the construction of fireproof partition walls, adaptable also for bungalows and cottages in districts where the much-maligned "Model" Building Bye-laws have not yet been introduced, for the thickness of such material did not, so far as I remember, in any case exceed 2½in., and the cost ranged at from 4s. to 5s. per superficial yard. The evolution of a substitute for brick walls for cottage building is not yet.

I was interested in noticing that our friends Messrs. Ham, Baker, and Co., who are as personally popular, I believe, among municipal engineers as their manufactures are in every respect excellent, were showing amongst their numerous exhibits a "waste preventing" water-post for public drinking fountains and for stand-pipes such as are necessary in courtyards in towns and also in villages where water is not laid on to each house, but where a stand pipe fixed in a common yard is made available for from two up to thirty or forty houses.

Whether it be in public fountains or stand-pipes, such as those last named, the taps are continually, as every surveyor and water engineer knows, out of order, and the waste of water and consequent soakage on the roads is unreasonable, and a source of considerable annoyance.

By a skilful design these engineers have so arranged an apparatus for attachment to the supply pipe to a drinking fountain or stand-pipe that a specified quantity of water, say a half or a whole pint for a fountain, and two or three gallons for a stand-pipe, can only be drawn at a time. The arrangement is so ingenious, and meets such a demand that the sooner surveyors and water engineers make an acquaintance with it the better.

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NOTICES.

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RURAL COUNCILS AND SANITATION.

THE attitude of Rural District Councils towards sanitary improvements is a matter which appears to be exercising some concern at present. The *Times* recently indulged in a very trenchant criticism of these bodies, pointing out that the majority of their members were farmers, never a very progressive class, who regarded public expenditure on reforms such as the housing of the labourer as an unnecessary imposition. Much of the information which reaches us from the rural districts fully bears out this assumption. It is well known that although these Councils as Sanitary Authorities have power to prevent the erection of new cottages without satisfactory provision for water supply and drainage, they do not in practice freely exercise it. The reason is obvious to those acquainted with the idiosyncracies of the rural intellect. They are averse to being thought unduly interfering or encroaching upon their neighbours' privileges. And this diffidence not only retards reform, but results in untold trouble and increased outlay in the future. In this policy of delay the Councils are sufficiently aided and abetted by the Local Government Board to encourage persistence, and thus it is that the recommendations of their Medical Officers of Health are ignored. Occasionally they are forced to move by an outbreak of typhoid or diphtheria. But as a rule nothing is done that can possibly be avoided, and even when it is done, it is scamped. It is in regard to the housing problem more especially that these bodies want stirring up. Miss Cochrane has recently in our own columns shown how utterly deficient is the present accommodation in certain districts coming under her own purview, but there is every reason to suppose that the same conditions, with modifications, exist all over the country. In some instances wealthy landlords are found who make it their duty to see that the labourers on their estates are properly housed; but in other cases the owners are too impecunious, or profess to be, to embark upon what they would term an unremunerative outlay. The worst offender, however, is the small owner, who has invested his savings in cottage property, and who knows little of sanitary obligations, and cares less. These landlords generally possess sufficient influence over their tenants to make an appeal to the Sanitary Authority out of the question, and very often the matter is further complicated by the small owner himself being a member of that body.

It is much to be feared that this constitutes one reason at least why the Rural District Councils do not exercise their full powers in regard to existing unhealthy houses. As the *Times* remarks, "the difficulties in the way of such action are partly common to town and country alike, such as the question whether a public body can exercise the same supervision as individual owners, or whether it is economically desirable that it should compete with private building enterprise; and perhaps, it may be added, the deficient pressure of public opinion upon such matters as sanitation or overcrowding." But the main difficulty, after all, would appear to be in the individual constitution of the Councils themselves, and in the lack of education and enlightenment among their members, for it is hardly to be expected that a body composed of men who require to be educated up to modern ideas upon sanitation and house accommodation as much as their own labourers are likely to constitute in the aggregate a highly competent Sanitary Authority. But, it may be argued, what of the officials—the Medical Officer, for instance? Cannot they educate public opinion? On the whole, we believe they do, but how often do we

find their recommendation ignored, and their opinion counted as "fads" by the very bodies for whom they act? It has been suggested that, as regards housing, the provisions enabling the Sanitary Authority to act upon the report of the Medical Officer of Health should be made compulsory instead of only permissive; or that some executive authority should be invested in the Medical Officer himself. We have no quarrel with that; indeed, we believe that it would be an excellent thing; but until public opinion is moved strongly and the education of the community in these matters assumes a more progressive shape, we can hardly hope for the rural districts to fall in line with the more enlightened urban communities.

Results of the Census.

The complete census returns will take a considerable time to compile and analyse, but from such of them as have already been issued some instructive deductions may be made. In the first place, turning to the populations of the larger towns, an interesting comparison at once suggests itself with the populations as estimated by the Registrar-General prior to the taking of the census. These estimate were based on the census of the preceding decade, allowance being made for an increase in the population based mainly on the ratio of increase during the previous decennial period. In the framing of these estimates there is, of course, room for a considerable margin of error, which in its turn will naturally affect the birth, marriage, and death rates calculated on the estimated populations. Constancy or uniformity in the progress of any one town from year to year, or in one decennial period after another, is not to be expected, nor is it found. But, on the whole, the Registrar-General's calculations will be found not to be so very wide of the mark. The net result of the census will, however, involve a complete rectification of the birth, marriage, and death-rates as previously calculated. In some cases the rectification required will be considerable. Take, for example, such a town as Greenock. The estimate of the Registrar-General placed its population at 60,267; the actual number, consequent on an increase of commercial activity, is 67,681. The result is very materially to improve the death-rate of the town, the estimated rate of 214 deaths per ten thousand of population being reduced to 192. In other towns, where the increase of population has fallen short of the estimates, the mortality rates will have to be raised. And so, in like manner, the process of revision will have to be applied all over the country. Turning next to the country districts, the Census figures already to hand confirm the evidence from other sources with which we are but too familiar, of the steady drift of the rural population into the towns. The cities grow larger, not merely on account of the natural law of increase, but because they are steadily draining the country parishes of their inhabitants; the rural districts, on the other hand, instead of exhibiting signs of a healthy increase in numbers, are manifestly dwindling. From the point of view of the public health, apart from other social and economic considerations, the fact is one which can only be deplored. The country, after all, is the well-spring of the nation's life. It supplies the towns with fresh and healthy blood. It is impossible, therefore, to regard this steady depopulation of the country to swell the already overcrowded city populations except with feelings of concern, for the result must be in the long run to exercise an unfavourable influence on the health and development of the inhabitants of the towns.

The Opening of Glasgow Exhibition.

The opening of the Glasgow International Exhibition is an important event in the life of the city. It is intended to signalise the commencement of the new century, and no effort has been spared by the promoters to make the "show" worthy of the city's fair reputation. During the last year, however, the Executive must have been harassed with many anxieties, for during that period the health of the city has been singularly unfortunate, having passed through at least two very trying experiences. First of all there was the outbreak of plague last autumn. It was of the mildest description, and the efforts of the Sanitary Authorities to stamp it out were attended with complete success; but for the time, in the eyes of the country and of the world, Glasgow was an infected spot. Then this year came the small-pox epidemic. From its extent it was much more formidable, and for fully three months it has kept the officials of the Health Department on the stretch. Between 1700 and 1800 cases have been admitted to hospital, and about 230 deaths have taken place. The worst of it is over, but it is not by any means eradicated yet, for at the end of last week there were still 158 cases in hospital. A comparison, however, with the preceding weeks shows that the rate of decrease has been most satisfactory, and such as to justify the confidence of the Authorities that the disease, if not absolutely checked, is now well in hand, and on the fair way to complete elimination. The presence of small-pox in the city need not prove a deterrent to intending visitors to the Exhibition, for not only are the cases now occurring very few, but they are, as they have been during the whole course of the epidemic, drawn almost entirely from the East-end, at a distance of several miles from the site of the Exhibition. At the same time the facts must be looked in the face, and the possibility of the attendance of East-enders from the infected districts cannot be ignored. Glasgow has, however, manfully grappled with the work of stamping out the disease, as it did also in the case of the plague, and as both visitations have already cost the city an enormous sum, we should sincerely regret if the success of the Exhibition were to be injured by fear of small-pox. The Corporation have, by way of preparation for the crowds of visitors that are expected, completely re-organised their tramway service, and converted it to electrical traction. The inauguration of the electric system

took place last week. As the new installation is described as being the most important in the country, it will doubtless prove attractive to engineers and members of Local Authorities.

Better Housing in the Highlands.

Among the matters dealt with in the report of the Congested Districts Board for Scotland, which was issued as a parliamentary Blue-book the other day, is the question of better housing in the Highlands, for which, the Commissioners state, there is a growing desire. "The people are becoming more and more dissatisfied with uncomfortable, unhealthy dwelling-houses, and with the unpleasant surroundings too frequently still to be found in many parts of the crofting area." With this feeling the Board have every sympathy, and they consider it of importance that crofters should be encouraged to improve their dwellings. The crofters are quite destitute, however, of the necessary capital, and as the Board learned that in certain cases landed proprietors had successfully established funds out of which loans were granted for the purpose of improvements, the loans being repayable by instalments, they were desirous of adopting a similar scheme for the congested districts, but found, unfortunately, that this was beyond their statutory powers. They suggest, therefore, that their powers should be extended. Another respect in which an extension of powers seems necessary is with regard to the provision of hospital accommodation. In the poorer Highland districts the difficulty of securing suitable hospital accommodation is almost insuperable, and the need is great. The Lord Advocate was recently questioned on this subject in the House of Commons, and he indicated, in his reply, that the amendment of the Congested Districts Act for this and other purposes would receive his sympathetic consideration.

Child-life "Frittered Away."

We do not remember seeing anything more disheartening than the record of the waste of child-life given by Dr. Pilkington (M.O.H., Preston) in his annual report. He states that during the past year 250 children died out of every thousand born—a proportion considerably in excess of that reported in any of the other large towns, Blackburn coming next with 220. To this great mortality amongst the very young the high death-rate of Preston is mainly attributable, and whilst the general mortality has in late years satisfactorily improved, the infantile deaths have, on the contrary, increased. Among the causes for this high infantile death-rate there are mentioned early marriages among factory workers, and the general employment of mothers in mills, together with the dangers attendant upon the nursing-out system. "If even the child—as no doubt is frequently the case—receives kindly treatment and attention, and is not drugged with one of the many so-called 'soothing syrups,' it too often falls a victim to food unsuitable, ill-kept, or badly prepared; and this not only at the house where it is nursed during the daytime, but also at its own home, where, through mistaken kindness, and while yet a toothless infant, it is regaled with such things as shellfish, tripe, tinned salmon, and pig's feet." "There are in every large town," continues the report, "and probably always will be, a certain number of homes where the wonder is that any infant can survive its nursing period; but it is lamentable to see how in the houses of better-class operatives infantile life is frittered away, and this apparently from want of a little knowledge or of attention to ordinary precautions." And so it will go on until the mothers have a proper home-life. Far better to have a little less money and more comfort; and when the operatives realise this a stop will be put to the slaughter of the innocents in many of our large towns.

Making an Example.

Last week a case of considerable importance came before the Recorder at the Central Criminal Court. A butcher of Highgate was charged with giving a bribe to a servant of the Metropolitan Asylums Board, in order to obtain certain information as to the giving out of some tender forms. The facts brought out were:—The Board from time to time advertised for tenders for the supply of goods to the various hospitals under their care. The tenders were sent in on printed forms, which the Board supplied, keeping a list of those tradesmen to whom these forms were issued. The defendant was a contractor in an extensive way of business, and had supplied the Board from time to time. In October of last year tenders were again invited, and the defendant applied at the offices on the Embankment for a form. It was handed him by the principal messenger, and then defendant asked him if he would supply him with a copy of the list of tradesmen to whom these forms of tender had also been issued. This the messenger declined to do. Defendant asked him on other occasions, and finally met him at the Barnet Railway Station, and, renewing his request, said, "I will give you a fiver and a card on my tailor for a suit of clothes if it comes off." The officer again refused, and then reported the matter to the Board. Acting under their advice, he afterwards wrote to the defendant, making an appointment with him in the City. In company with a detective-inspector of the City Police, defendant was met at the Ludgate-hill Station, when he was handed the list of contractors he had asked for, and the messenger received £5. This was the offence complained of. The defence set up was that the defendant acted in ignorance of the law, but the Recorder would not accept this as an excuse, and inflicted a fine of £500. We can only hope that this heavy penalty will act as a warning to others, for seekers after undue advantages are by no means confined to butchers.

The City of London new M.O.H.

When it was known that Dr. William Collingridge intended to offer himself as a candidate for the position vacated by the decease of Dr. Sedgwick Saunders, it was generally

expected that he would be appointed Medical Officer for the City of London, and these expectations were fulfilled on Thursday last. When it came to voting, the only other one at all in the running was Dr. Waldo, who did such excellent work in Southwark before that district was merged into the new borough of Newington. Dr. Collingridge has well earned the promotion thus obtained. For twenty years he has fulfilled with infinite credit the onerous post of Medical Officer of the Port of London, a district extending from Teddington to the Nore, some seventy miles. Prior to receiving that appointment he had some experience on the Continent. He was but twenty-two years old when the Turco-Servian war broke out, and he went out to Belgrade as a volunteer surgeon, and at once went to the front to organise the hospitals for the Servian army. At the close of the war, Dr. Collingridge received the special thanks of King Milan, and was decorated with the Order of the Takova. In addition to attending to the duties of Port Medical Officer, Dr. Collingridge has devoted considerable time to volunteering, being attached to the Honourable Artillery Company and the Volunteer Medical Staff Corps, besides occupying other positions in connection with Army medical work. He has also shown practical sympathy with the St. John's Ambulance Association, and the Life-Saving Society. In 1897 he was appointed Milroy Lecturer to the Royal College of Physicians; in 1898, Examiner of State Medicine to the University of Cambridge, and he represented it last year at the International Congress of Hygiene at Paris. He is a member of nearly all the recognised health associations in the metropolis, and has written several books bearing on different phases of sanitary science.

THE INSTITUTE OF SANITARY ENGINEERS

(Incorporated).

OFFICIAL TRANSACTIONS.

THE NEED OF UNIVERSAL EDUCATION ON SANITARY MATTERS.

(*Continued from page* 358.)

Now what constitutes education on sanitary matters? I should say a knowledge of the necessary conditions that ensure good health, amongst which are the following:—(1) Plenty of light and sunshine; (2) pure air; (3) pure water; (4) cleanliness of person and surroundings; (5) proper food.

Light and sunshine.—What a blessed gift is sunshine, and how little some people seem to know that the sun is the world's purifier, or they would not shut it out of their houses by blinds, shades, and curtains just because fashion dictates such a practice. It may save the colour in their carpets and curtains, but they lose the colour from the faces of their children and themselves, and frequently pay the doctor the cost of many carpets. Light and sun, of course, are necessary to the life of both plants and animals; the destruction of the most dangerous disease germs has often been immediately accomplished by the powerful rays of the sun; whilst with its assistance plant life is able to take up the poisonous carbonic impurities expired by man, assimilate them in its own growth, and return the oxygen back to the air for our use again. If the public had better knowledge on this matter alone they would insist upon more parks and open spaces being provided in all our towns and cities, well supplied with plant and tree life to carry on such work for our common benefit. It is true that open spaces in the centre of a city are very costly; but if we go to enormous expense for space for commercial purposes, the gain to the health of thousands of people should be well worthy a similar outlay, which I am sure would be willingly paid for if the people were properly educated as to the individual and collective advantages to be derived from such breathing room. Let the aim of the householder be to have light and sunshine, if possible, freely admitted into every part and corner of our dwellings and business places. Especially let all sanitary fittings be open, and as far as practicable, so placed that light can get all round and underneath them, for dark places even in well-regulated households soon collect dirt and other accumulations, in which alone can disease germs exist and multiply around us.

Pure air.—The greatest essential to healthy life is an atmosphere containing its fair proportion of oxygen. This, however, is not always easy to obtain outside our buildings, let alone inside, on account of the many impurities from breathing, manufactures, the production of heat, light, and food, and general animal and vegetable decay. Simple lessons could be given of how the atmosphere of a room becomes contaminated by breathing alone, when repeatedly used without renovation; when the air we breathe, containing, say, 21 parts in the 100 of oxygen, is expired or returned to the air with but 16 parts of that element, the other five parts retained in the body being replaced by poisonous vapours. Imagine the effect of continually breathing such an atmosphere. The burning of ordinary gas inside a room has a most serious effect upon the atmosphere, for one large burner will take as much of the life-sustaining parts of the air as four adults, and replaces it by carbonic impurities most dangerous to human life. The value of electric lighting, from a health point of view, should also be thoroughly explained and impressed upon the people. The effects of impurities arising from manufactures, such as white lead works, chemical works, dye works, match making, and other similar industries, which all assist in reducing the vitalising quality of the atmosphere, are also great. A proper knowledge of these matters by those controlling such industries would enable them to use the best precautions in the interests of themselves, the community at large, and especially those they associate with, as many of these impurities are brought home on their clothes, which would with proper knowledge and care have been left behind.

If dirty air was as visible as dirty water, what a shock most of us would get! Such an illustration would do more for the science of ventilation than either talking or reading. If you offered a man a glass of dirty water to drink you would insult him, but try to keep him out of a place where he will breathe equally dirty air, and possibly he may insult you. I contend, therefore, that very much more could be and should be done in educating those in our schools, and the public generally, on the great importance of obtaining the purest air possible wherever we are.

Take the question of dust alone; how lightly people use the word, and at times with what contempt. We have all seen dust floating in the sun's rays, especially in dark places where narrow rays have penetrated; it takes the form of minute particles, many of which have an organic origin. Indeed, these organic impurities are always found in inhabited rooms, especially in sick rooms, being thrown off from the lungs and skin to a considerable extent. We are given some idea of this by a medical man, who informs us that a family of five persons occupying a room during the day continuously for twelve months would have produced something like 40 lb. of this organic matter in the year. Information of this kind should make us rather welcome the annual spring cleaning, than grumble and growl at the incon-

veniences usually attending it. Dust also contains other matter, such as portions of hair, cotton, and woollen fluff, coal, wood, and various living organisms; arsenic has even been found in the dust of rooms, possibly from the dye of cheap wall papers. Now this dust must be thoroughly cleared away; I mean burnt, not thrown outside the door to be blown in at the windows. As we boil our clothes, so let us burn dust, and destroy all harmful germs that may exist therein.

With regard to the dangers that exist in dust, the wealthy are just as indifferent and ignorant as the poorer classes, perhaps more so; they certainly have more places for accumulating it. The thick carpets and curtains, tops of wardrobes (which seem, as a rule, to be made for the express purpose of collecting dust), hollow moulded cornices and cornice poles, space under beds hidden by hangings, in lumber rooms, closets, and below stairs, and in many other corners I could mention, dust and dirt find secure hiding places. Indeed, some luxurious homes are furnished with no consideration for sanitation, and are practically prepared for the cultivation of disease germs.

If we turn to the homes of our poorer classes, where the sleeping and living room is often in one, the greatest care should be taken to keep such apartments as clear of dust as possible. Often the good wife being anxious to have things looking clean for her husband's return, disturbs the dust about the room by a hasty brush round, without opening doors or windows to allow a circulation through the room, with the result that it is flying about the room at the time of his entering. It is of no use stirring up dust to let it settle down again, it should be scrupulously collected and burnt.

Another source of danger is found in churches and halls by the accumulation of dust in the trenches provided for heating pipes; disease germs must at times find a breeding place amongst the dust below the hot pipes, which cannot be effectually cleansed. It is not unusual to see a person suffering from some lung or throat trouble expectorate down these gratings, with what risk to others can well be imagined by the instructed observer. With proper sanitary knowledge and conscientiousness, these things would not be tolerated for a moment.

Pure water.—We are fortunate in most of our towns in having an efficient and tolerably ample supply of water available, and laid into our homes, supplied at a moderate cost both for dietetic purposes and for cleansing. The position, however, usually given for the storage cistern in the house leaves much to be desired; nor does the average householder ever get an opportunity of seeing if it is clean or otherwise, unless he is called upon in the middle of the night to explore the false roof in order to hammer up a burst pipe. They are put into dark closets or dusty false roofs, where the air is stagnant; and this is the case frequently in really good class property. It has always been a matter of surprise to me that Sanitary Committees, before passing plans, do not insist upon a cistern room being provided, of proper dimensions, and lighted and well ventilated, and protected from dust and other foreign matter. Surely the position of our drinking supply is worthy of as much consideration as the position of our water-closets, and more so than many details which local officials stubbornly stand out for.

The question of filters is another item upon which better knowledge is much needed by the general public. I never go into a house or hotel where I find a filter without making inquiries respecting it; and my experience is that not 10 per cent. of those who use filters ever think that they will become absolutely filthy if not regularly cleaned and re-charged. I have frequently come across the old carbon filter with its charge cemented securely inside, which has been in use for periods varying from five to ten years without ever being cleansed or re-charged.

A little knowledge here would make it quite clear that if a filter is doing any good it must be abstracting the impurities from the water, which are being accumulated in it; otherwise it is letting the impurities pass through, in which case it is of no use at all. How often does the householder run off the water from his cistern which has been standing stagnant during the time he has been away on a holiday? Water bottles are frequently left without changing the water, and many other little domestic matters are neglected chiefly for want of the necessary knowledge of simple sanitary laws.

The water supply to outlying farms and country houses is frequently of very doubtful quality, and is responsible for the spread of fevers to an extent well known to Sanitary Authorities, yet the users of the water are often indifferent as to where it comes from. I remember staying at a farmhouse for some little time, at which I discovered some days after I had taken up my abode, that the main storage tank was simply sunk in the ground about half a mile from the farm, and it was a regular habit of the youngsters to go and have a dip in it during the hot days and sail their toy boats. I need hardly say that I made a somewhat strong protest, with the result that it was built up above ground and properly covered and protected. Both the farmer and his wife, to use their own language, merely expressed the remark that "They had ne'er gi'en it a thought."

(To be continued.)

The following meetings will be held on Wednesday, May 8th, 1901:—General Purposes and Finance Committee at 4 p.m., Election Committee at 5.15 p.m., Council Meeting at 7 p.m.

OBITUARY.

MR. W. SANTO CRIMP.

Our readers will deeply regret to learn of the decease of this well-known expert in sewage disposal. It took place on Sunday week at his residence in Kensington. A few weeks ago the deceased gentleman was at Leeds, when one morning he was seized with a shivering fit. He immediately returned home, but so far from recovering, was obliged to take to his bed. No improvement took place, and on Sunday week he succumbed to pneumonia. Mr. Santo Crimp was born in Devonshire, and was in the forty-ninth year of his age. It was in 1878 that his first important work was undertaken, being in that year appointed Resident Engineer to the Croydon Rural Sanitary Authority, to superintend the drainage of Merton, Morden, Mitcham, and Wallington. Two years later he was appointed Surveyor to the Wimbledon Local Board, a position he held for ten years with honour and credit to himself and considerable advantage to the district. During his period of service at Wimbledon he re-modelled the sewage farm and works, reconstructed a great portion of the main drainage, and constructed and laid out the extensions. He designed the lines on which the present station bridge is being built, and the fire station in High-street is another of his works. He also prepared a scheme to supply Wimbledon with chalk water from Woodmansterne.

In 1890 he became District Engineer under the London County Council, to which body he also rendered distinguished services. It was by his advice that the ends of the settling tanks at the London County Council outfall works were connected, enabling the services of forty men who had previously been engaged in cleaning them out to be dispensed with, while the amount of suspended matter extracted from the sewage was so greatly increased that additional sludge steamers had to be provided. It is consequently not too much to say that the improvement in the state of the Thames is in a great

measure due to the improvement in the treatment of London sewage effected by the advice of Mr. Crimp. He retained his office under the London County Council until 1895, when he resigned in order to enter into partnership with Messrs. E. Brough Taylor and G. Midgley Taylor, under the style of Messrs. Taylor, Son, and Crimp. He was a member of the firm at the time of his death. During his connection with the firm he was consulted by the Authorities of Glasgow, Cardiff, Leeds, and many other important provincial cities and towns, and at the time of his death was carrying out work for many of them.

In 1899 he went to Bombay, having been engaged by the Authorities there to advise as to the drainage of the town, and while in India was requested to advise upon the drainage of some twelve other cities and towns. He was acting as consulting engineer in regard to no fewer than six Bills at present before Parliament. As a member of the Institute of Civil Engineers, a Fellow of the Surveyors' Institute, and a Fellow of the Geological Institute he was greatly respected, while he had also obtained some reputation as an author of technical treatises. His papers on the ventilation of sewers and sludge pressing appear in the "Proceedings" of the Institute of Civil Engineers. They were entirely original, and the results of his research were recognised as so valuable that the methods advocated have since been universally adopted. His book on sewage disposal, though written prior to more recent developments of sewage treatment, is still regarded by many as a standard work on the question, and has gone into the third edition. Mr. Crimp's death, at the zenith of his professional career, will be a serious loss to the engineering world.

National Health Society.

OFFICIAL TRANSACTIONS.

Annual General Meeting. — The annual general meeting of the Society was held on Wednesday, April 24th, at 53, Berners-street. The report of the work for 1900 was read, and showed a considerable increase and advance in the work and influence of the Society. The Chairman, the Rev. Prebendary Ridgeway, drew particular attention to the marked success of the Society's students in obtaining public appointments as Sanitary Inspectors during the past year. Miss Louisa Twining, the veteran member of the Society, spoke of the present insanitary and unsatisfactory arrangements for the removal of dust and house refuse in London streets. Sir C. Thomas Dyke Acland, Bart., was elected Chairman of Council, and after the re-election of other officials, the proceedings closed with votes of thanks to all the hon. officials for their valuable assistance during the year. Amongst those present at the meeting were the Rev. Prebendary Ridgeway, Miss Louisa Twining, Sir C. Thomas Dyke Acland, Dr. Kenwood, Dr. Childs, Col. H. B. Hamilton, Mr. J. J. Vesey, Mr. Malcolm McWharrie, Dr. H. Willingham Gell, Dr. A. T. Schofield, Mrs. H. B. Hamilton, Mr. Lawrence Hall, Miss Christine Hall, &c. &c.

Appointments.—We have much pleasure in announcing the success of Miss Bevan in obtaining the appointment as Sanitary Inspector to the Borough of Camberwell. Miss Bevan was trained by the National Health Society, and passed the examination of the Sanitary Inspectors' Examination Board in January last. It will be remembered that several similar appointments have been gained by the Society's students during the past few months, so that this further success is a matter of great satisfaction to the Society. We have also to congratulate Miss Curwen on her appointment as Assistant Lecturer under the West Riding County Council.

ASSOCIATION OF NATIONAL HEALTH WORKERS.

Special attention is drawn to the very interesting series of lectures organised by the Association of National Health Workers, to be given at 53, Berners-street, during next week. In addition to those lectures mentioned in our last week's columns, Dr. Robert L. Bowles, M.D., F.R.C.P., has most kindly promised to give a lecture on "The Proper Management of the Physical Relations of the Tongue, Mouth, and Throat in Various States of Unconsciousness, such as Drowning, Apoplexy, Epilepsy, Convulsions, Bronchitis, Hæmoptysis, and in Paralysis from Accident, Concussion of the Brain, and Fractured Skull; Stertorous Breathing, Snoring, Opium Poisoning, Anæsthesia, Suffocation from Poisonous Gases, Syncope, &c.," on Thursday, May 9th, at 5.15 p.m. All members of the National Health Society are invited to attend these lectures.

Public Works.

SEWERAGE.

The Urban District Council of Altofts seeks to borrow £7000 for a drainage scheme.

A loan of £10,000 has been contracted for the new sewerage scheme at Lutterworth.

The Bradford-on-Avon Rural District Council is about to carry out the sewerage of Holt.

The Newtown Linsford Council has received sanction to a loan of £1950 for sewerage and sewage disposal.

The Alford Urban District Council has received the sanction of the Local Government Board to the borrowing of £9000 for sewage works.

Sanction has been obtained to the borrowing of £32,962 for the purpose of constructing sewers at Foleshill and Stoke, recently added to the city of Coventry.

The Works Committee of Dundee Town Council has accepted the tender of Mr. Charles Johnstone to construct the new sewer in Wellburn-street, Lochee, at a cost of £118 15s.

The Loughborough Town Council has resolved that application be made to the Local Government Board for sanction to borrow £613 for street making and the sewerage of Meadow Lane.

Lieut.-Colonel C. A. Smith, R.E., one of the Inspectors of the Local Government Board, opened an inquiry at Cotherstone last Thursday relative to the proposal to borrow £2650 for the drainage of the village.

The Totnes Town Council has resolved that, subject to the approval of the plans by the consulting engineer, tenders be invited for a new sewer in Victoria and Ticklemore streets. It was said there was an impression in the town that the sewerage scheme would be a failure, but that view was not shared by the Council.

Colonel W. Langton Coke held an inquiry at West Bridgford recently into an application by the Urban District Council for sanction to borrow £7423 for the purchase of land adjoining their sewage farm for purposes of a refuse destructor, sewage disposal, stabling, &c., and £1100 for works of sewage disposal.

A special meeting of the Borth Rural District Council was held last week to further consider the Local Government Board's letter in reference to the drainage of Borth. The Council directed the Clerk (Mr. Hugh Hughes) to ask the Central Board whether it required a scheme for the drainage of the whole area of Borth.

On Tuesday in last week the flats employed on the construction of Douglas sewer outfall were decorated with flags and bunting in celebration of the laying of the last pipe. The outfall is an important section of the scheme now being carried out for placing the sewering of this important watering-place in a thoroughly modern and scientifically approved condition. This section has been constructed by Messrs. John Aird and Co., London, and has taken over twelve months to build. The outlet is placed several hundred yards seaward of Conister Rock, so that all sewage may be carried out to sea. The full cost has not yet been made up.

Colonel C. H. Luard, R.E., Inspector to the Local Government Board, held an inquiry at Bredbury last week to inquire into the Urban Council's application for power to deviate from the scheme of sewerage sanctioned on the 14th August, 1899, and for which a loan of £7855 was sanctioned, and for sanction to borrow £6480. The object for which the loan is required is for sewers and construction of sewage disposal works at the rifle range, Lower Bredbury. The scheme for which sanction was applied had been reported to the Mersey and Irwell Joint Committee, who considered it an improvement on the scheme sanctioned. There was no opposition.

The Select Committee of the House of Commons, presided over by Mr. Fison, last week resumed consideration of the Cardiff Corporation Bill, which sought to empower the Corporation to construct new intercepting and other sewers. The petitioners were the Penarth Urban District Council, the Glamorgan County Council, the Taff Vale Railway Company, the Barry Railway Company, and the Llandaff and Dinas Powis Rural District Council. Early in the sitting there were signs of agreement, and the Committee adjourned on two occasions to facilitate consultation between counsel. The important point at issue was seen in a desire on behalf of the opponents to place upon the promoters the obligation to provide sewage capacity in the main sewer at the rate of 70 gallons per head of the population from time to time draining into the sewer. The Corporation argued that with such a proposal there was no finality whatever to the scheme. They submitted that they would provide sewage capacity to the extent of 4,500,000 gallons, this to be the final sewage capacity provided under the scheme, and which was calculated at 50 gallons per head of the population estimated at present at 60,000, with a prospective increase of 50 per cent. The Committee decided in favour of the preamble of the Bill upon the terms proposed by the Corporation, but whereas sixty years were asked for the repayment of loans, forty-five were granted. Clauses were introduced into the Bill giving protection to the Local Authorities for their roads and sewers, and permitting them to drain into the proposed new sewer where it passed through their districts on terms to be arranged, or, failing arrangement, as might be settled by arbitration.

WATER.

The Hyde Town Council requires £7500 on loan for additional water mains.

A company is being formed to supply London residents with rain or soft water for the bath at 2d. a gallon.

A waterworks scheme for Cricklade, in the Rural District of Cricklade and Wootton Bassett, is estimated to cost £7000.

The Yeovil (Without) Parish Council has already entered a protest against the increased water charges made by the Borough Council.

Mr. Meade-King held an inquiry recently into the St. Just District Council's application for sanction to a loan of £3483 for the water supply of St. Just Churchtown.

At a recent meeting of the Guildford Town Council it was reported that the Local Government Board had signified its approval of the loan for £1700 for works of water supply.

The Kelso Town Council has engaged Mr. Harry W. Taylor, A.M.I.C.E., of Newcastle-on-Tyne and Birmingham, to report upon the Burgh Waterworks, with a view to their extension.

At the annual meeting of the Brownhills Urban Council it was decided to authorise the South Staffordshire Company to extend their water mains at Norton Canes at a cost of £241 on the usual guarantee.

Notice has been given that the Manchester water rate will be laid at the next meeting of the City Council. It is proposed to levy a domestic water rate of 8d. (yielding £36,000) and a public rate of 1d. (yielding £13,000) the same as last year.

At a committee meeting of Dunoon Commissioners, it was agreed, after an acrimonious discussion lasting two hours, to practically adopt the late Water Committee's recommendation and to have two of Bell's filters laid down as an experiment at a cost of over £300 each.

A novel and excellent proposal is being considered in New York. It is to preserve the fresh water for drinking and cooking purposes exclusively, and to erect a system of stand pipes which will supply every house with an abundance of pure sea water for bathing, and flushing the drains and sewers and street sprinkling.

The St. Helens Water Committee recently had under consideration the special report of the Water Engineer, in which he urges the necessity of providing additional storage accommodation, the cost of the reservoir and connections being £22,700, and the land £1940, a total of £24,640. The Committee decided to have an additional reservoir.

A Local Government Board inquiry has been held at Rochford with reference to the appointment of the Rural District Council for power to borrow £25,000 for works of water supply for the contributory parishes of Hadleigh, Hawkwell, Hockley, Rayleigh, Rochford, South Benfleet special drainage district, including the construction of works in the parish of Thundersley.

The Accrington District Gas and Water Board, instead of raising the price of gas, has increased the water rents for the ensuing quarter. For the poorest class of houses the increase is 4d. per quarter and upwards. In the case of some publicans and beersellers the increase is 25 per cent. There is a great deal of grumbling about the new tax. Accrington, Church, Rishton, Great Harwood, and Clayton-le-Moors are affected by the increased price.

The fight over the Tees Water Bill did not end in the House of Commons Committee-room. A meeting of the riparian owners have decided to carry the opposition to the House of Lords, the General Purposes Committee of the Darlington Corporation passed a resolution to a similar effect, and it is very probable that other bodies who objected to the measure in the Commons will follow suit, notwithstanding the modification to which the Bill was subjected before it emerged from the Committee stage.

At a meeting of the Galston Town Council it was unanimously agreed to accept the offer of Mr. James Steel, contractor, Galston, amounting to £5408 1s. 6d., for the construction of new waterworks for the burgh, and that of Glenfield Company (Limited) Kilmarnock, for valves and other fittings, £79 5s. 6d. There were twelve tenders for the former and ten for the latter. Work is to be completed within twelve months. The supply of water is to be brought from near the same source as the Newmilns water supply, in which Galston at present shares.

A PAPER entitled "Researches on Moorland Waters, Part II.; On the Origin of the Combined Chlorine," by the borough analyst, Mr. W. Ackroyd, has been communicated to the Chemical Society of London, and will be printed in due course in the Society's "Proceedings." It deals with the water of Widdop, and the investigations relate to the fifty odd tons of salt contained in the reservoir, which is traced to the rainfall.

IN connection with the Glenfarg water district, the Finance Committee of the County Council is to recommend at the quarterly meeting that an agreement should be entered into between the trustees of Major-General Kirkland, of Wester Fordle, and the County Council on behalf of the Perth District Committee regarding the right of a supply of water from Lochel Blank Burn for the Glenfarg water district.

THE Wisbech Water Bill came before a Select Committee of the House of Lords on Tuesday in last week. The decision of the Committee was on all points in favour of the Waterworks Company. The Committee were of opinion that the charges for small gardens were not too high, and with respect to the charge for supply other than domestic, they did not see their way to diminish the company's charges, neither did they see any reason against the capital asked for by the company being raised. They were of opinion that the annual value should remain as at present. On Wednesday the Bill was taken *pro formâ*, and certain clauses upon which there was agreement the previous day were inserted.

THE Commissioner for Public Works at Adelaide has received information of the striking of a valuable supply of artesian water in the dry north-east. For some time boring has been proceeding on Yandama Creek, about forty miles east of the southern end of Lake Callabona, and artesian water was reached at a depth of 1566ft. At 1600ft. a strong flow was tapped, the fresh water rising to the surface at the rate of 20,000 gallons a day, and there is every prospect of a largely increased quantity being obtained by sinking a little deeper. The value of the supply is almost incalculable, because the locality was previously one of the driest in the State, and teams frequently were unable to travel for perhaps twelve miles at a time.

THE Commission under the Private Legislation Act met again last week to resume consideration of the Irvine Water Supply Extension Provisional Order. The Commissioners were Sir T. Gibson Carmichael, presiding, Lord Belhaven, and Sir Walter Thorburn, M.P. Mr. Wood was Clerk of Court, and Mr. Dundas, K.C., and Mr. Constable appeared for the promoters, and Mr. Salvesen, K.C., and Mr. Pitman, K.C., for the objectors, Ayr County Council and the Burgh of Saltcoats. Prior to the meeting of the Commission, a conference took place between the objectors and the promoters, the result of which that the objectors agreed to withdraw their opposition, in view of certain concessions by the promoters. Mr. Dundas explained that under the joint arrangement the rights of the traders under the priority clause in the 1881 Order would be conserved, as against traders outside the scope of those coming under the priority clause; that the limits of water supply under the Order should be the burghs of Irvine, Saltcoats, and Kilwinning, and all parts of the parishes of Irvine, Dundonald, Kilwinning, Stevenson, Ardrossan, and Draghorn, to which gravitation would permit the water to rise to. The order was also held to apply to any extensions of the burghs mentioned. It was also provided that the assessment under the Order should be levied in the respective areas in accordance with the amount of the rental. Some evidence was thereafter led with reference to compensation water, after which the Commission found the preamble proved, and the clauses were then adjusted.

IN view of immediately proceeding with the scheme for the augmentation of the Crieff water supply, at a special meeting of the Water Committee of the Town Council, the estimates for the supplying of piping were considered, and out of the four offers, the successful firm was Messrs. R. Laidlaw and Sons, ironfounders, Glasgow, the contract price being £3290 4s. 8d.

SUCCESSFUL artesian well boring has saved the ratepayers of Tunbridge Wells an expenditure of £70,000. The Corporation had to decide whether a reserve water supply should be obtained by the erection of works at Ashdown Forest, Sussex, eighteen miles away, at a cost of £100,000, or an artesian well bored at Pembury, three miles distant, at a cost of £30,000. The last-named project was ultimately decided upon. The wisdom of the choice was proved, when, at the close of a six-days' pumping test, four new wells at Pembury yielded on an average 1,000,000 gallons of water daily. The water is of excellent quality, and as far as can be ascertained the supply is inexhaustible.

A MEETING of the owners and ratepayers of the urban district of Biggleswade was recently held at the Town Hall "to take into consideration and determine upon the expediency of consenting to the said Council promoting in the present Session of Parliament a Bill to constitute a Joint Board consisting of representatives of the Biggleswade Urban and Rural District Councils, and to confer upon such Board all necessary and proper powers in regard to the execution of works for the supply of water to the urban district of Biggleswade and to the whole or parts of the rural district of Biggleswade, together with such further powers as may be incidental thereto, including the raising of the necessary funds, and that the expense of promoting such Bill (so far as the same shall be payable by the Urban District Council) be charged upon the District Fund and General District Rate." The resolution was carried unanimously.

THE St. Helens Water Committee has for a considerable time pursued a settled policy, having for its object the provision of a sufficient number of pumping stations and wells, which were felt to be the first necessity for properly supplying the borough with water. During all this time the Committee has been fully alive to the importance of securing additional reservoirs for the storage of water to ensure a continuous supply in the event of breakdowns of the pumping engines or mains. With the near approach of the completion of the Melling scheme, the Committee is in a position to consider the reservoir question. A special meeting was held in the water engineer's office recently, when the chairman (Councillor T. R. Dixon-Nuttall) laid the matter before the members, and after discussing the pros and cons, it was decided to take steps to construct a reservoir. Plans for a covered reservoir will be prepared. The probable cost is £30,000, but it is expected that this will not increase the water rate by more than one halfpenny.

A MEETING of ratepayers, convened by the Mayor, was held last week at Louth to consider a proposal made by the Highways Committee of the Corporation to purchase the Louth Waterworks Company either by arbitration or by the payment of a sum of £15,000. The Highways Committee, having decided in favour of the purchase, obtained the opinion of Mr. Mansergh, who, having examined the property, recommended that the Council should not offer more than £15,000. The Town Council then offered £13,900, which was declined. The Highways Committee then recommended the Council either to increase its offer to £15,000 or to submit the matter to arbitration, which, Mr. Mansergh estimated, would cost between £2000 and £2500. The company have made arrangements for obtaining a supply of water to supplement their present supply from Welton, and the Corporation, having discussed

the matter in committee, decided to take counsel's opinion upon the legality of such proceeding. The opinion received is against the company.

LIGHTING.

The Chester Gas Bill has passed the Committee of the House of Lords unopposed.

The Birstall District Council's Electric Lighting Order, granted by the Board of Trade, has been confirmed by the Examiners of Standing Orders in the House of Commons.

Mr. Malet, on behalf of the Local Government Board, held an inquiry at the Town Hall, Conway, into the application of the Corporation for power to borrow £800 for gasworks purposes.

Mr. W. J. Dibdin has reported to the Gravesend Town Council the result of a test which he had made of the quality of gas supplied to the local testing station: Illuminating power, 14·8 candles; pressure, 1·3in.; sulphuretted hydrogen, none.

At a recent meeting of the Pinner Parish Council the Clerk read the report of the Board of Trade with reference to the Provisional Order of the Pinner Gas Company, in which it was stated that the Order would be granted, subject to certain modifications.

The Town Surveyor having reported to the Malvern Urban District Council on a scheme for establishment of a refuse destructor in conjunction with an electric lighting installation, a public meeting of ratepayers carried a resolution in favour of the scheme by a considerable majority.

The British Columbia Electric Railway Company, Limited invite subscriptions for an issue of 6400 non-cumulative 5 per cent. preference shares of £10 each, ranking for additional dividend rateably with the ordinary shares after such ordinary shares have received 7 per cent., being the balance of the authorised issue of 20,000 shares.

Last week a Committee of the House of Commons began the consideration of the Mond Gas Bill. The Bill authorises the formation of a company, with a capital of £1,000,000, to supply gas manufactured under patents taken out by Dr. Ludwig Mond for power and heating purposes in the large industrial district 100 square miles in extent to the north-west of Birmingham.

At a recent meeting of the Aberdeen Electric Lighting Committee, the gas manager reported that for the month of March there had been manufactured 53,528,000 cubic feet of gas, as compared with 53,723,000 for the corresponding month last year. The sale of coke had realised during March £858, as against £844 in the corresponding month of 1900. Ammoniacal liquors realised £634, as compared with £892 in March of last year.

The Ardrossan Gas and Water Bill was considered before the Commission under Private Procedure at Ayr on the 24th ult. The Bill seeks power to extend the gas and water schemes already in the hands of the Corporation, at a cost of about £31,000. The only opponents were the Ardrossan Harbour Trustees, who objected to being brought within the rating areas, and whose opposition was confined solely to being included in the rating areas. After evidence for the promoters, led by Mr. A. S. D. Thomson, who appeared for the promoters, Mr. Constable, who appeared for the objectors, stated that he had no evidence to place before the Commissioners. The Commissioners, after some consideration, held that the preamble of the Bill would be held as proved if certain legal rights were conserved to the owners of the harbour of Ardrossan. It was accordingly agreed to frame a clause giving effect to this suggestion, and the preamble of the Bill was then passed.

In the House of Commons, on Friday, the Colwyn Bay and Colwyn Urban District Gas Bill was read a third time. The Arlesey Gas Bill and the London and India Docks (New Works) Bill were read a second time.

At Gloucester last week Mr. Henry Knowles conducted a sale of consolidated ordinary (New) stock (ranking for a maximum dividend of £5 per cent. per annum) in the Gloucester Gaslight Company, at the gas offices. There were 50 lots of £100 each for disposal, but only 21 were sold. The total realised for the 21 lots was £2526 10s.

The lighting of the Imperial Theatre, London, by electricity, both for the stage and front of the house, has been carried out by Messrs. Vaughan and Brown, Limited, who also supplied the gas braziers, fire hydrants, &c., fire-proof curtain, and ventilation. The large tableaux curtain was also fixed by the same firm. The whole of this work has been excellently carried out under the personal supervision of Mr. G. C. Vaughan, A.M.I.E.E.

At the ordinary weekly meeting of the Dublin Port and Docks Board a report was read from the Engineer in reference to a letter calling attention to the advantages of the "intensified gas system." Mr. Griffiths, in the course of his report, stated that the "intensified gas system" simply meant that the gas was compressed mechanically before being burned. Through Mr. Wigham's courtesy he had had an opportunity of inspecting his apparatus at Capel-street. There was no doubt as to the advantages of the system from an illuminating point of view, as anyone who had seen it at work in the Strand, London, could testify.

Much interest locally is being taken in the application of the Elland Gas Company for further powers. The District Council decided to oppose the Bill in Parliament unless certain substantial concessions, including option of purchase, were granted. Negotiations which have been proceeding between the Council and the Gas Company have up to the present failed to produce any satisfactory agreement, and the Council has now decided that an offer of £125,000 be made to the company for the undertaking and all the assets, the company to pay their own debts and liabilities. If this offer is not accepted the Council will persist in its opposition to the Bill.

The new gasworks at Perth were formally inaugurated on Saturday last. The works are beautifully situated on the banks of the river Tay, and with siding accommodation from the adjacent railway every facility is provided for the rapid and ready working of the gas establishment. The conditions of working are greatly improved, and every facility for cleanliness is provided, and the new gasworks as completed are amongst the finest and best-equipped in Scotland. The new works occupy an area of about 4¼ acres. The site is quite away from the city and from the direction of its present extension, and yet near enough for convenience in working. The gasholders which supply the lighting district are midway between the new works and the city. The initial capacity of the works is equal to a make of one million cubic feet of gas per twenty-four hours, and the works are capable of being extended within the boundary walls to at least three times that quantity, while the arrangement is such that these additions can be carried out without change of existing plant. The works have been designed with great care as to their being equipped with the most modern appliances, and as to the possibility of extension as consumption demands without disturbance of existing plant. The offices consist of a handsome suite of rooms—the general office, manager's room, assistant's room, drawing-office, and lavatory. The meter and exhauster houses are tastefully finished with tiled floor and dado. The workmen's rooms attached to the retort-house are well furnished and fitted with baths and lavatories of the best class. The roof of this building is formed by an

iron water tank for water pumped from the river, which supplies the whole works, except for drinking and washing purposes. A large fitting shop, with smithy attached, enables all necessary repairs to be effected on the spot. A weighbridge and office is erected on the railway siding at the junction of the high and low-level railways, so that all materials received and despatched may be weighed and recorded. The works are most complete in every detail.

GENERAL.

The Ludlow Town Council proposes to borrow £7500 for an electric lighting and refuse destructor scheme.

A loan of £9445 has been sanctioned by the Local Government Board for the extension of the Ilford Urban Council's Isolation Hospital.

A Local Government Board inquiry has been held at Hastings with reference to the application of the Town Council to borrow certain sums of money for wood paving, &c.

Last week, after an exciting debate, the Norwich Town Council decided to appoint a lady Sanitary Inspector to visit the homes of the poor and give advice on health matters.

The Baths Committee of the Manchester Corporation has approved of the plans for the baths which are to be built in High-street, Chorlton-on-Medlock, at a total estimated cost of £40,000.

A Local Government Board inquiry was conducted at Gosport recently into an application by the District Council for permission to borrow £3840 for the erection of a number of houses for the working classes of the district.

Mr. M. K. North, one of the Local Government Board's Inspectors, conducted an inquiry at Blackpool into the Corporation's application for sanction to borrow the sum of £3085 for the purposes of private street improvements.

Mr. H. H. Law held an inquiry at the Town Hall, Morley, recently, on behalf of the Local Government Board with respect to an application by the Corporation for sanction to the borrowing of £21,500 for works of street improvement, £18,700 for waterworks purposes, £7035 for purposes of electric lighting, and £3600 for the erection of stables and the purchase of horses, carts, &c.

A Local Government Board Inspector has held an inquiry at Rugby with reference to the Council's application for sanction to borrow £2500 for the completion of the public offices, £820 for the purchase of land for widening West-street, and a further sum of £2500 in order to carry out certain requirements of the Local Government Board in the provision of a new storage reservoir at the river Avon.

The question of erecting a destructor has been again considered by the Moss Side Urban District Council. Mr. Lees, the recently-returned member for east ward, on behalf of his constituents, said he had a mandate to oppose by every possible means the erection of a refuse destructor, but after discussion the recommendation of the Scavenging and Health Committee to consider a tender for carrying out the scheme was approved.

We learn that an effort is about to be made to establish a municipal system of public telephone communication in Liverpool. Encouraged by the success which has attended the experiment in Glasgow, many public men in Liverpool believe that the time has arrived when the city should have an independent telephone service, under the control of the municipality, and thus put an end to the monopoly which has been so long enjoyed by the National Company. The matter will be brought before the next meeting of the City Council, and that body will be asked by resolution to declare in favour of the establishment of a municipal system.

Motor fire engines for use in London are now under consideration. Commander Wells has recommended as a trial car, one manufactured by the Locomobile Company of America, and the Committee have advised the London County Council to purchase such a car for £286.

In Lambeth the Local Committee which has in hand the securing for the public use in perpetuity of forty-three acres of wooded land as an addition to Brockwell Park, has now received nearly the whole of the amount required for the purchase—namely, £66,858. A recent grant of £200 from the Peabody Donation Fund, and a second grant of £500 from the Southwark Corporation, bring the Committee within £500 of the total amount required. More small subscriptions from tenants and landlords in the locality would, it is stated, be appreciated; and it is noted that not a single small subscription has been sent in from the appeal exhibited on a huge board at the Herne-hill gate of the park for some months past.

At the meeting of the Limerick Corporation last week, the Mayor presiding, a lengthy report was read from Sir Acheson MacCullagh, Local Government Medical Inspector, relative to the sanitary condition of Limerick. Sir Acheson MacCullagh states that the streets are kept in a very dirty condition. The scavenging staff appear quite unable to cope with the work. The dirty and insanitary condition of the smaller streets, lanes, and passages was most noticeable, the surface of the roadways being most uneven and littered with ashes, vegetable refuse, and other objectionable matter. Pigs were kept throughout the city in most unsuitable yards and premises. There were a good many houses in the city unfit for human habitation, and he was informed that though magistrates' orders to close these houses had been obtained, the orders had not been enforced. A large majority of the houses in lanes, &c., off the main streets were entirely without sanitary arrangements, and many were overcrowded. The Mayor said the citizens were very heavily taxed at present, and if the suggestions made were carried out it would mean 15s. in the pound on the rates.

Under the guidance of Dr. Watt, Medical Officer for the county of Aberdeen, an inspection of the Gordon Hospital, Ellon, was made recently by the members of the Ellon District Committee. The original hospital was founded some twelve years ago, but quite recently extensions have been effected, consisting of a new block of buildings and a new flat added to the administrative block. The total cost of the original structure was £747, and it is expected that with the recent extensions the capital expenditure will approach £2500. The first visit was paid to the diphtheria department, which is situated in the left wing of the new block, and being self-contained, lies furthest away from the road. The right wing of this building is for typhoid cases, and in each wing there is a nurses' room, used also as a reception room for doubtful cases. The accommodation in this block is for fourteen adults, besides several small cribs for children. The administrative block lies some few yards nearer the road. After inspecting these two blocks, the members of Committee examined the original block, which is now reserved for scarlet fever cases. The accommodation is the same as in the new block, but improved lavatory arrangements have recently been provided. The steam disinfector, mortuary, drying loft, &c., lie in an outhouse to the left of the main buildings. Much interest was taken in the working of the disinfector, the process of which was described by Dr. Watt. The germ-laden clothing, bedding, &c., is put into a wire cage at one end of the machine and thoroughly steamed, after which hot currents of air are introduced to facilitate the drying process. As explained by Dr. Watt, no matter how great the vitality of the germ spores, half an hour in the disinfector would destroy all life.

The work of the Health Department of Birmingham is increasing so rapidly that the establishment in Rotton Park-street, where the dry refuse collected on that side of the city is burned, is no longer adequate to the demands made upon it. Fortunately, the Committee are in possession of a piece of land adjoining the present premises, and they are desirous of utilising this for the erection of a new destructor, together with a range of stabling and the necessary chimney-stack and buildings required in connection with the work carried on by the department. At a meeting of the Health Committee, last week, plans of the buildings were under consideration, but they were not finally approved, inasmuch as a few alterations were suggested. These will be made, and at the next meeting the subject will once more be reviewed, when the scheme will probably be accepted and recommended to the City Council for adoption. The total cost of the extensions and equipment is estimated at about £30,000. The new destructor will be built on the lines of the Montgomery-street establishment.

PERSONAL.

The salary of Mr. W. H. Wells, Sanitary Inspector for Bilston, has been increased to £120 per annum.

The salary of Mr. J. A. Brodie as City Engineer for Liverpool has been increased from £1000 to £1200.

The salary of Mr. A. B. Holmes, Electrical Engineer for Liverpool, has been increased from £1600 to £1800.

Dr. W. E. Robinson has been appointed Medical Officer and Public Vaccinator for the Sonning district of Wokingham.

The City Coroner, Mr. S. F. Langham, will retire on June 25th on a pension of £600 a year, the salary of his office being £1000.

The Local Government Board has sanctioned the re-appointment of Dr. J. Dixon Adams as Medical Officer of Health for the rural district of Yeovil.

Dr. William Collingridge, M.A., M.D., LL.M., has been appointed Medical Officer of Health for the city of London at a salary of £1000 per annum.

Mr. Frank L. Teed, Public Analyst for Islington and Camberwell, has been appointed Public Analyst for the city of London in room of Dr. Sedgwick Saunders, deceased.

Miss G. D. Bevan has been appointed an additional Sanitary Inspector for the Borough of Camberwell. The salary is £125 per annum, rising by yearly increments of £5 to a maximum of £150.

LAW CASES.

Liabilities of a Drainage Board.

In the Irish King's Bench Division No. 1, before the Lord Chief Justice and Mr. Justice Boyd, judgment was given in the case of the King (Parker) *v.* Carrigrohane and Ballincollig Drainage Board, in which the question for decision was whether the Drainage Board could be compelled to pay the respondent, who was prosecutrix, the sum of £189, which included £9 for damages awarded in an action brought by her against the Board for injury caused to her property through the negligence of the defendants in the construction of the works authorised by the Drainage Acts, and £139 for costs of action, and £40 being taxed costs of an unsuccessful appeal by the Board against the judgment in the action. It was contended by the Drainage Board that they had no money in hand, and no power to levy a rate to pay the demand.

Mr. Justice Boyd, in delivering the judgment of the Court, said he was of opinion that the Drainage Board had power to levy a rate for payment of the claim, and should be compelled by mandamus to do so. It seemed absurd that the Legislature should have conferred privileges on the Board without imposing on them corresponding obligations.

The Lord Chief Justice considered it would be very unreasonable to hold that this Board could sue a person and recover from him, and that if they were beaten, costs could not be recovered against them. It was decided in the Court of Appeal that the action lay against them, and it appeared to him to be a necessary corollary to that decision that costs should be enforced. Mr. Justice Barton agreed with the result Mr. Justice Boyd and he arrived at. They would give judgment for the amount claimed and costs for the respondent.

Counsel for the prosecutrix—Messrs. M. J. Bourke, K.C., and Geo. Green (instructed by Mr. Geo. Murphy). For the defendant—Mr. A. M. Sullivan (instructed by Mr. M. Healy).

NOTES AND QUERIES.

Subscribers may obtain advice on matters appertaining to Public Health Law and Municipal and Sanitary Engineering. Letters should be addressed "Notes and Queries," The Sanitary Record, 5, Fetter-lane, London, E.C. If an answer be required immediately, a stamped addressed envelope must be enclosed

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intercepting traps, and cut off any flow from cesspool to ditch. On revisiting the premises I found that the drainage had not been carried out as required by the notice, and that some sinks were blocked up entirely. Will you kindly advise whether the requirements given by notice under Sec. 94 of the Act of 1875 are in order, and whether you would advise proceedings being taken under Sec. 95, as the requirements have not been carried out, but some work done which is quite different to that prescribed, and the drain has been disused."

Answer.—The requirements given in the notice under Sec. 94 were proper and necessary, and they would, in our opinion, be supported by Justices. The Authority may now, on default of compliance with the notice, proceed under Sec. 95 for a summons against the owner. They may in the alternative serve a notice upon the owner under Sec. 23 of the Act of 1875—the houses being without drains sufficient for effectual drainage, and sufficiency in this case includes improper and unsatisfactory—to provide proper drains, and on his default they may carry out the work and charge him with the cost thereof. The advantage of proceeding under the section is that it is not necessary for the Local Authority to prove that a nuisance exists.

2181.—Insufficient Drainage: The Powers of Local Authority.—"Reval" writes:—"In my district, which is rural, I have received complaints of nuisances arising from the drainage of waste from house sink into an open brick channelling. The joints of some are very open and uneven, and allow waste water to stand and stagnate and cause bad smells. Can the Local Authority compel the owner to lay a covered pipe drain properly trapped, &c.? The house in question is a farm house."

Answer.—The house is without a drain sufficient for effectual drainage, and the Local Authority are enabled under Sec. 23 of the Act of 1875 to require the owner to make a covered drain emptying into a covered cesspool or other place which they may direct, the drain to be of such materials and size as on the report of their Surveyor may be necessary. On the owner's default the Local Authority may do the work and recover the cost from him. The waste pipes must be properly disconnected from the drain and discharge over trapped gullies.

2182.—Water Supply: Closing Well: Cost of Providing New Supply.—"Inspector" writes:—"B is the owner of a house. The water used for domestic purposes is found on analysis to be bad. As it would be impossible to provide a new supply for £8 13s. 4d., what course could my Council take in such a case? Is there nothing we can do but close the well?"

Answer.—The Rural Sanitary Authority should proceed under Sec. 70 of the Act of 1875, and obtain power to close the polluted well. They should also serve notice upon the owner under Sec. 3 of the Public Health (Water) Act, 1878, to provide a sufficient supply for the use of the inmates of the houses. If the supply cannot be obtained for £8 13s. 4d., the Rural Authority may apply to the Local Government Board to determine what is a reasonable sum, not exceeding £13 in any case. The owner may object to the notice on any of the grounds mentioned in Sec. 4, and the Sanitary Authority may be required to contribute a part of the expense of providing the supply.

2183.—Testing House Drains by Private Request not Inspector's Duty.—"Inspector" writes:—"Am I as Inspector obliged to go and examine and test the drains of dwelling-houses at the request of the owners or occupiers free of cost simply to satisfy their curiosity? For instance, a mansion is let to a person who, before closing the agreement, wishes to have the drains tested. The Inspector is sent for, and spends the greater part of two days in the work of examining and reporting. Query. Can the Inspector charge for the work, and if so, at what rate?"

Answer.—It is not the Inspector's duty to perform such work at the request of private owners. He is employed by the Sanitary Authority, and not by the former, and when he executes work which should be carried out by a private tradesman, which is distinctly the work of such in the case named, his position is being abused, and he is wrongfully employed. If the Inspector is employed to give the whole of his time to the duties of his office he must not charge any fees without the consent and direction of the Sanitary Authority. The fee may be from 10s. 6d. for a small house to £2 2s. for a mansion.

2184.—Sanitation: Lectures on.—T. G. B. writes:—"Referring to query 2170, April 18th, 'Memo,' who asked for matter for a lecture on 'Sanitation,' would find a lecture entitled 'Breathing and Ventilation,' which is freely illustrated by Mr. (now Dr.) Wm. Daley, Chief Sanitary Inspector of Bootle, crowded with useful information. The lecture was dslivered to the members of the North-Western Association of Sanitary Inspectors, and published at 1s."

Answer.—We are indebted to our correspondent for the information. Copies of this and any other books may be obtained post free at the published price from the office of this Journal, 5, Fetter-lane, London, E.C.

2185.—Death-rate in Thirty-two Great Provincial Towns: Where Obtainable.—"M. O. H." writes:—"Would you kindly give me the birth-rate, death-rate, and zymotic death-rate for the year 1900 in the thirty-two great provincial towns. If you have not these at hand, will you kindly inform me as to where I coold obtain them?"

Answer.—We regret we are unable to give the statistics desired. These, however, we believe, will be furnished the querist on application to the Registrar-General, Somerset House, London, W.C.

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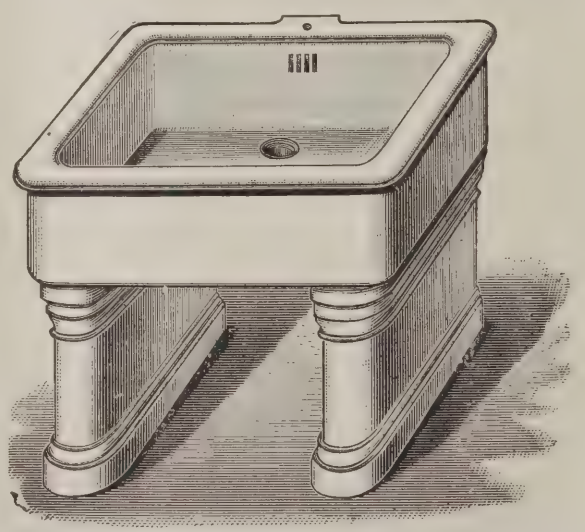

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NUISANCES AND METHODS OF INSPECTION.[1]

By J. Spottiswoode Cameron, M.B., B.Sc., M.O.H. Leeds.

NUISANCES AND INSANITARY CONDITIONS.

(*Continued from page* 382.)

What these are we shall now proceed to consider, and I shall ask you to imagine that you are going with me over an ordinary dwelling-house. On the slips which I hold in my hand are a series of questions to which I ask the District Inspectors in Leeds to supply me with answers, when they are going through their districts from house to house. The queries are grouped and are printed on ruled paper. They are intended to be pasted into little note-books with lines the same distance apart, and are so arranged that the Inspector can have the queries open while he is writing his answers to them in the book. The answers only are written. The numbers in the column on the left correspond to the columns in the house-to-house book into which the information has to be afterwards transferred. In this latter there is room for ten houses on a folio, and the end of the book has some cross-ruled paper for diagrams and plans. The Inspector is advised to familiarise himself with the questions and to write the answers in his note-book before leaving the house. The questions are not, however, arranged in the order in which the examination would always be most conveniently made.

Cols. House-to-House Queries.

1. Date of previous inspection :
2 and 3. Street | Position in street and aspect :
4. Occupier :
5. Owner's name and address :
6, 7, and 8. Trade in house | No. of rooms | Kind of rooms, cleanliness of | Area of ground floor :
9 and 10. No. of inmates : $\frac{\text{M—5 | 5-15 | 15 +}}{\text{F —5 | 5-15 | 15 +}}$
11. Water supply : From which Corporation tank ?
12. No. rooms in which windows open : Both sashes, one sash, casement.
13. Rooms with chimney | Ditto with chimney open :
14 and 15. Is house back-to-back ? | Is there a through draught ?
18 and 19. W.C. (special queries) | Sink :
20 and 21. Basement drains | Other drains (bath, lavatory, &c.):
22, 23, and 24. Main sewer | Depth, feet | Size, inches | Distance, yards | State if pipe, brick, stone ; shape :
25, 26, and 27. Yard drains | Fall pipes | Eaves spouting | Distance of street gullies, in yards :
28 and 29. Damp walls and cause | Foul smells :
30 and 31. Privy—kind | Condition | Distance, yards | No. of families using it : Ashpit, same details :
32. Result of drain test | Remarks : Distance of street gullies, whether with catchpit or not, &c. Other nuisances.
33. References :

There is another slightly different form for use in cases o zymotic disease. The principal difference lies in the greater detail required as to the work, age, and movements not only of the patient himself, but of the other members of the family. In the corresponding zymotic register there is a space under the column for work or school place, for particulars as to flushing and ashpit cleansing of the said work-place or school.

A few convenient contractions will be found on the back of the zymotic question form.

CONTRACTIONS.

D. means drain of house (as sink pipe, cellar drain, &c.), connected *directly* to street drain or sewer.

T. means that an S or syphon *trap* is interposed.

C. means that the house drain is *cut off*, and opens over a trapped gulley or grid outside the house.

T.C. same with syphon trap inside.

T.V. means that the trap is efficiently *ventilated*.

S. means that the fall pipes or *down-spouts* go directly into the drains.

S.C. that the spouts are disconnected from the drains.

F.V. means that the W.C. soil-pipe goes *full* size above the eaves.

V. 1½ means that a ventilating pipe of 1½in. diameter goes from the trap of soil-pipe above the eaves, and similarly for other sizes.

Memo. Addresses to which members of family may have been sent must be given in full. Extent and efficiency of isolation to be stated. Any conditions dangerous to health not coming under headings to be recorded.

Let us now go in imagination over the house. We shall begin by going downstairs.

In descending the cellar steps, notice would, of course, be taken of the amount of air and light in the passage, and of any smell of coal gas. The flooring of the basement should be carefully examined for signs of damp, should be tapped occasionally for hollowness, and carefully inspected for marks of recent disturbance, and for any ring marks or other evidences of mobility. The illustration (Fig. 1) shows what we once found in Huddersfield in examining a house in this manner. The drainage of a group of houses had been carried to the back, and the sink and bath wastes all carefully disconnected. After all this was done, however, the Corporation brought a new sewer along the front street, and issued orders that all drains should be connected to it. The owner must either reorganise his drainage, or collect it, and bring it under one of the houses. He elected to do the latter, and, having a horror of sewer gas, determined to protect his tenants by an intercepting trap. This he placed in the middle of the keeping cellar floor, and thoughtfully placed a flag over it, by which its whereabouts could be easily ascertained. On removing

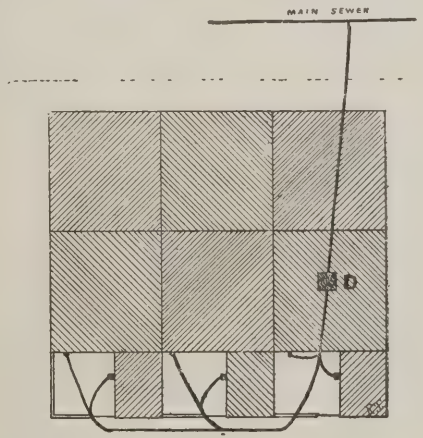

Fig. 1.

[1] A lecture delivered in the Philosophical Hall Leeds, April 13th, 1901. The illustrations to this lecture are from Dr. J. Spottiswoode Cameron's little work, entitled "Is my House Healthy?" published by Mr. R. Jackson, Leeds, and are reproduced in these columns by special permission

the flag, this is what we found, (Fig. 2). Fortunately the days of mason's traps are numbered, but a trap of any kind in this situation would be sufficiently objectionable.

Coal gas is often mistaken for a smell from the sewer. It is not only a nuisance on account of the discomfort it occasions directly, but, more especially now that water gas is being largely added to it at the works, it is a serious source of danger to health. Frequently the nose is a sufficient guide to the leak. Sometimes it is necessary to light the gas jets all over the house, to then turn all the burners off, and last of all the meter, and having

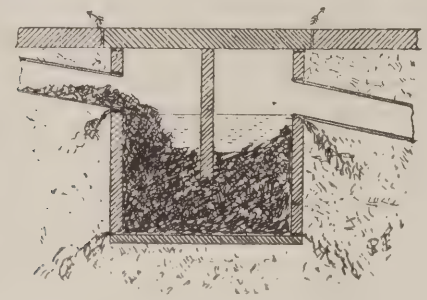

Fig. 2.

done so, to leave the gas pipes thus filled till next day, in order to ascertain by the presence of air in the pipes if there has been any leakage.

The ventilation of the basement is frequently defective. There should be some provision as by a Sherringham ventilator (Fig. 3) for the admission of fresh air from the outside of the house. Too often an attempt at this is made by letting the air in at the cellar window, which is frequently just over the trap in the area that is kept foul by the dish water from the kitchen sink.

It is with some a question of how far dampness of the keeping cellar is a fault and how far it may be regarded as a virtue. There can be no doubt whatever that if the damp is due to sewage impregnation of the subsoil, still more so if it be attributable to leaky drains, that it is an evil to be dealt with. Should the damp be due to a boggy condition of the ground on which

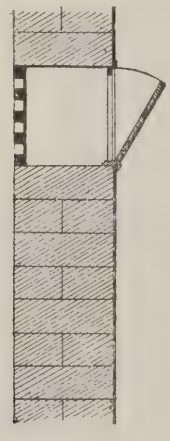

Fig. 3

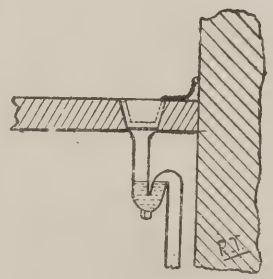

Fig. 4

the house is built, although the moisture be merely the soakage from vegetable matters, if the amount of moisture entering be at all excessive, it calls, in my opinion, for remedy. On the other hand, if the amount of moisture be very slight indeed, and that little from the natural moisture of a clean soil, it may be disregarded. It is different altogether if the damp room is a dwelling room. Measures should in that case be taken to remove the dampness, or the use of the room should be discontinued. It is unnecessary to insist that in curing damp walls it is essential to ascertain the cause. Usually this will have to be postponed to a later stage of the examination.

It may seem a trifling point, but it is important to feel sure in making your survey of the basement that you have covered every portion of the excavated area. No coal cellar, chip-place, wine cellar, must be omitted, and you must have a clear idea when you have finished of the exact amount of the area left solid, and of the means taken to prevent dry rot.

The ground floor is most conveniently examined next. Here, again, an accurate notion of the plan of the house must be obtained, and every inch of floor space explored. Special note must be taken of boarded-in pipe courses and the way they run. Any

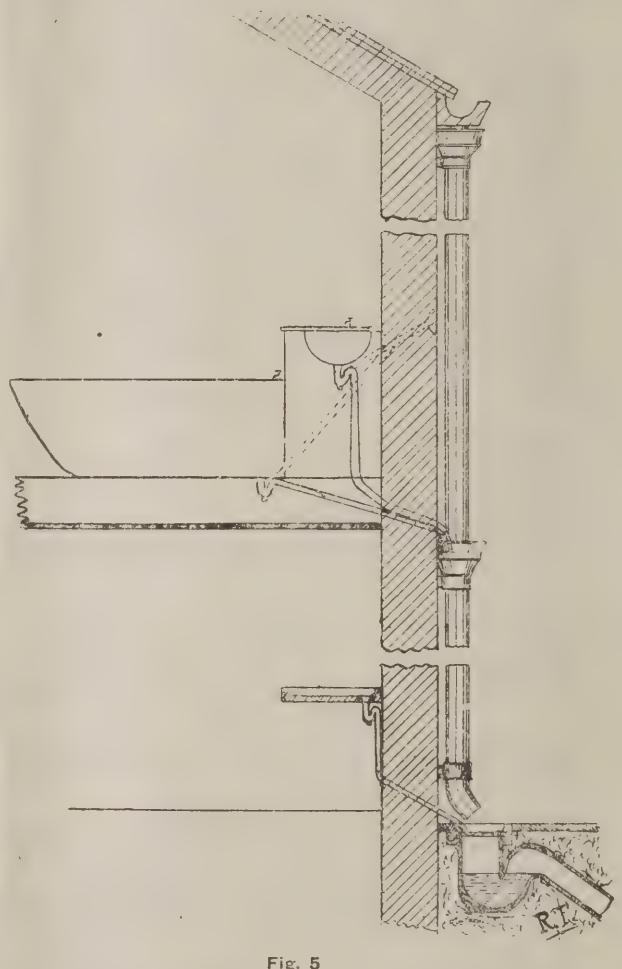

Fig. 5

guess as to what is behind must be afterwards verified at the appropriate time and place. Loose paper, scarred ceilings, will be inquired into. In working over any area, either on the ground floor or in the basement, it is convenient to have some fixed practice as to procedure. Start, for instance, at the foot or head of the cellar stairs, as the case may be, and keeping persistently to the left, leave no opening unexplored and no void space unaccounted for. In this way you may cover the whole ground with some amount of certainty. Important, however, and essential as it is that your inspection should leave no portion of the dwelling unexamined, certain parts will claim special attention. The kitchen and its sink, and the scullery and its wastes are amongst these. The sink, whether in the kitchen, in the scullery, or in the basement, must have its waste taken by the shortest possible route outside

the house and severed in the open air. Inside the house it is on the whole convenient that there should be an S trap to prevent a back current from the gully trap outside. It should be small, because every trap is a nuisance, and the larger the trap the greater the nuisance. The slide shows the usual trap with which you are all familiar (Fig. 4). The usual mode of disconnection is shown in another diagram (Fig. 5). Unfortunately, there still exists in many

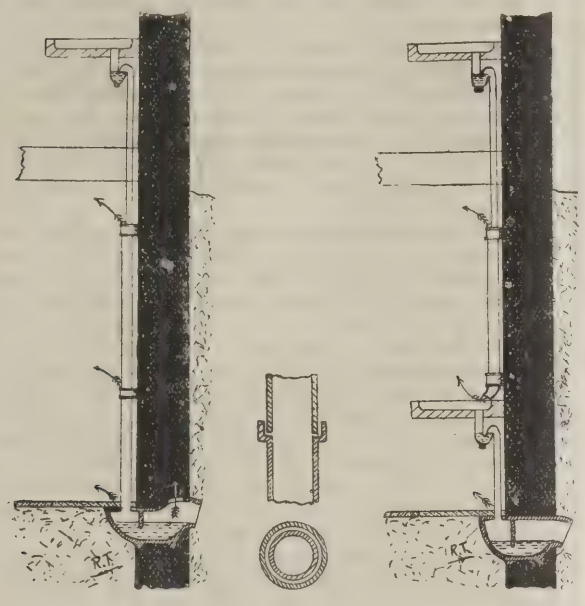

Fig. 6 Fig. 8 Fig. 7

houses, even in Leeds, other and less unwholesome methods of dealing with the sink waste. Two of these by means of "box traps" are shown in the diagrams (Figs. 6 and 7). Not infrequently the evil is aggravated by the employment of pipes of different metals to remove the wastes. But even if the metal used be the same throughout, there will sooner or later be a giving way of the luting of the joints and an escape of the gaseous products of decomposition, as the points shown by the small arrows in the diagrams. That this must be so is evident if we consider that the upper and inner pipe (Fig. 8) must be heated by the passage of hot water down it, and consequently expand before the lower and outer portion of the joint gets at all warm. The intermediate luting is therefore compressed. Exactly the contrary occurs when on a warm day cold water goes down the pipe. Then the inner and upper tube contracts, pulls upon the luting, and these alternate processes in time destroy the joint. As just said, the destruction is all the more rapid if the inner and outer metals have themselves different coefficients of expansion. It is hardly necessary to say that an inspection of the sink drains will include an examination of them in action as well as a careful inspection of the pipe by the eye. The inside trap will be examined and, perhaps, cleaned. The outside gully may, if near, be examined now, or, if difficult to get at, later on when taking the outside of the house.

(*To be continued.*)

In a long report, presented by the Local Government Committee to the London County Council on Tuesday, it was pointed out that in the City there are a large number of hereditaments considerably under-assessed, the total estimated deficiency being at least £690,000.

THE INSTITUTE OF SANITARY ENGINEERS

(Incorporated).

OFFICIAL TRANSACTIONS.

THE NEED OF UNIVERSAL EDUCATION ON SANITARY MATTERS.

(*Continued from page* 390.)

Cleanliness of person and surroundings.—This is a branch of sanitary education that is undoubtedly of the first importance, but which receives perhaps the least attention. The regular and thorough cleansing of the skin is absolutely necessary to those who would enjoy perfect health. How people exist without a free use of the bath seems difficult to realise when one considers that the perspiration from the skin is, in its way, as impure as the contents of the slop pail or sink waste, and when this is allowed to remain on the surface of the body it becomes a kind of varnish over the pores of the skin, which effectually clogs part of the drainage system of the body, with serious consequences. The ancient Romans knew this, and were far ahead of even the opening of the twentieth century in their cleanly habits of washing and bathing.

I hope the time is not far distant when regulations will make it compulsory to include a bath in every house, for a daily bath and the regular change of clean clothing are invaluable for everyone, and especially for children. I know, however, that the education of the poorer classes in this important matter has not yet had the desired results, for I have seen baths used in houses for dog kennels and rabbit huts, doing duty also as washing tubs, or full of plants, instead of for bathing, the purpose for which they were provided. Here is a case of giving people a benefit without first educating them as to its proper and necessary use.

Then the question of clothing, looked at from a sanitary point of view, is a most important one. For instance, colour has an effect upon health, and the habit of wearing dark clothing in summer in this country should be discouraged.

Surely one can mourn the loss of one's friends without putting on deep black clothes, for black in summer absorbs the heat to a greater extent than any other colour, nor is it warmest in winter, for it gives off heat more readily than lighter shades. Its only point is that it will store up a large amount of dirt and dust without showing it, and consequently we don't grieve about the dirt, and like to assume it is not there.

Then we have the dreadful habit recently adopted by ladies of letting the trains of their skirts act as pavement sweepers. Looked at from a sanitary point of view, and without any reference to fashion or custom, it is difficult to imagine a more dirty or offensive habit than the trailing of their skirts in the nameless abominations of the streets. How any decent-minded woman tolerates and obeys such a fashion is altogether beyond man's comprehension; surely there is need of further education here. If mothers really knew what risks they place themselves and their children in, I do not think such a state of things could exist. How many colds and fevers are brought on by inefficient clothing. The wealthy adopt a somewhat scanty apparel in ball-rooms and theatres where draughts abound, and at times a very doubtful atmosphere also, for fashion's sake, whilst our poorer people lay themselves open to similar dangers through poverty, often through no fault of their own.

Men also become the slaves of fashion, and during summer, in dry weather, turn the bottom of their trousers up, and make dust and dirt collectors of them. This is as hygienically ridiculous as it looks absurd. The most important item with respect to dress is that it should be kept as clean as possible, especially under-clothing, which is absolutely necessary to that perfect

health which science and common sense might ensure. As sanitary experts, therefore, our duty dictates that we should advocate ample provision for washing purposes, especially in the homes of our artisan classes, whose heavy manual work makes a frequent change of underclothing advisable. A good bath and change of clothing are often as valuable and refreshing as a few hours' sleep.

Infection.—I now come to another important point, which want of time makes it necessary to touch upon very briefly, namely, "The spread of infectious fevers." The carelessness with which many people expose themselves and those about them, to this risk is astounding, and must be largely due to ignorance, especially when we find people trying to hide infectious cases from the Sanitary Authorities, to escape the trouble of disinfection and its consequent inconvenience in their homes—an inconvenience which cannot be compared with the probable danger to themselves, their friends, and the whole district. That our poorer classes willingly assist one another in times of sickness and trouble is a characteristic we must all admire; indeed, one wonders what would happen to a household with slender means if this noble, charitable feeling did not exist. At the same time, it is one of the chief causes of the spread of diseases. Frequently before the nature of the sickness is known many kind and sympathetic neighbours are around the patient, and take away and spread infection before the officials have any chance of isolation, and these afterwards have the greatest difficulty in tracing where contact begins and ends. Proper knowledge would suggest the greatest caution, and assist materially in preventing the spread of fevers in such a manner. Then we have the carelessness of those who themselves suffer from infectious troubles; take the case of consumption as an example. It is a common occurrence for people so suffering to spit about in public, down gratings, over hot-water pipes, in railway carriages, and other equally objectionable places. This is a habit which is dangerous to others, for the germs of consumption become dry, mix with the dust, and are blown about, spreading infection all round.

In their own interests, also, consumptives should be careful to select residences with dry, well-drained subsoils, with concrete below the floors, and to have the fullest ventilation possible. Rats spread fever through the sewers, and should be treated with suspicion wherever found; they can lay on sewer gas to a house by their tracks as effectually as can an open pipe. Water traps are provided to the drains as a security against sewer gas, but the average householder, who knows more about mouse-traps, does not consider that during dry weather the water evaporates, if not supplied by some fitting in regular use, making the trap worse than useless, though he would willingly protect himself by filling it with water, did he know the necessity. People would not drink dirty water if they could get it clear by going to a tap, neither would they breathe dirty air if, by filling the water seals, they could avoid it. Flies are doubtful inhabitants, and their ability to spread disease is a question open to discussion. They do not like cleanliness, and generally do not visit a house run on sound sanitary principles.

The question of cremation, as against our present system of burial, is one that the nation must give careful consideration to in the immediate future. I am aware that sentiment enters largely into this question, and will make it most difficult to tackle. Cremation was largely practised by the ancient Greeks and Romans, and there is undoubtedly a feeling amongst the educated classes for its reintroduction under proper safeguards against abuse. In dealing with infectious bodies, both in the house, the church, and the ground, it must be admitted that there is the greatest risk, especially in town cemeteries in thickly populated districts, where both air and water are liable to contamination, whilst the traditional Irish custom of "waking the dead", is positively dangerous. Cremation promptly carried out effectually removes these risks, and should have the earnest consideration of this Institute. Indeed, these are subjects far-reaching and important, upon which there is great need of universal sanitary knowledge.

Good food.—The question of food is also a very important one, but I fear I am wearying you with illustrations to which any of you can add from your own experience. It is, moreover, more a question for the medical man than for the Sanitary Engineer; but the question of providing cool, well-ventilated pantries away from all chance of poisonous gases requires the careful consideration of the architect and the householder. I must pass on to the more difficult question of how the people are to be educated to so realise their individual responsibilities to the community at large that they will act every day so as to assist in the stamping out of preventable disease.

The following methods are worthy of consideration: First, sanitation and hygiene must take a very much more prominent place in the subjects taught in our schools; indeed, as I stated before, it is every whit as important as reading, writing, and arithmetic, if not more so, and the teachers should be carefully selected and impressed with its importance, and grants paid only on those students whose passes include this subject. This would lay a foundation for future improvement on a universal scale. Secondly, some effort should be made to reach the householder, for it is a question that comes home to all. This is much more difficult, but I believe might be done through those Authorities who have charge of the health of the people.

The time has arrived for the creation of a separate department of health—a "Government Board of Health"—upon which the medical and sanitary professions should be well represented, and which should be presided over by a Minister of Health. This would ensure a uniform practice on sanitary matters throughout the nation.

Local committees might be thoroughly reorganised and placed directly under the control of this Government Board of Health. This would remove them from the fear of local influences, which, at times, no doubt unintentionally, seriously hampers such Authorities in conscientiously carrying out their duties. Such a Committee might consist of the Medical Officer of Health, Borough Surveyor, the Engineer to the Water and Gasworks, Chief Sanitary Inspector, Chairman of Sanitary Committee of the Council, &c.

Free and popular lectures for the people on "Domestic Sanitation," and "The Natural Laws of Health" might be given in a simple and interesting form, especially to the artisan classes, whose limited means and residences in thickly populated districts make it so desirable for them to have a broad knowledge of such matters. I am deeply interested in this question of education, which must be considered in conjunction with that enormous problem, "The Housing of the Working Classes," if success in the latter is to be obtained. Although I fear I have not handled this subject in the efficient manner it deserves, I trust it will secure the careful consideration of the members of this Institute, and be dealt with more fully by those whose experience and ability best qualify them to move in the matter.

The Chairman, Mr. E. R. Palmer, having briefly spoken of the pleasure of seeing and hearing Mr. Bland, who had come such a long distance to give his paper, a cordial vote of thanks was awarded the author on the proposal of Mr. J. Farley, seconded by Mr. H. M. Dove, and supported by Messrs. T. M. Taylor and E. Durant Cecil, the last of whom referred to the good work already done voluntarily and gratuitously by the National Health Society.

BUILDING TRADES EXHIBITION.

[Third Notice.]

A lattice-girder roof covered with "Red Hand" felt formed the stand of Messrs. D. Anderson and Son, of London and Belfast. Within were samples of tarred felts, and inodorous felt for roofing and lining. On a raised bench were a small model of the circular wooden lattice girder felted roof; and by its side another model showing the various applications of silicate cotton or slag wool for sound and fireproofing buildings and insulating cold stores. Specimens were shown of silicate pipe cloth for covering steam pipes; hair fabric for covering hot and cold-water pipes, and brine and ammonia pipes; dry-hair felt in sheets and lengths; and plasterers' hair. The arrangements left nothing to be desired.

Golden anchor suspended from a beam was an attraction to any one who desired to inspect the "salt" glaze ware of Mr. James Woodward of Swadlincote. And here were arranged in excellent order the sanitary specialities for which his woodwork is well-known. Drain pipes with Esmy's patent excentric shoulder, and connections, manhole chamber, and fittings in white glazed ware, and garden edgings, interspersed with terra-cotta flower vases, chimney-pots, and bricks in a variety of colours made a very effective display.

Uralite is a fireproof and non-conductive material composed of asbestos fibre and mineral substances, and is a powerful non-conductor of heat, cold, and electricity. It is waterproof and unaffected by hot or cold water, atmospheric influences, and gases. Hence the British Uralite Company, Limited, settled temporary at Islington in a hut constructed of this material in order to show the building world the uses to which Uralite may be applied. In the hut we saw how Uralite can be veneered for panelling interiors, and how it can be painted, grained, and polished for house building purposes. Builders might find Uralite useful as a lining for walls and partitions in hospitals, asylums, and workhouses. For temporary erections Uralite will prove invaluable.

A very neat two-roomed "week-end" bungalow, composed of Connah-Wright's patent dovetailed corrugated metal sheeting, is the object-lesson presented by the Fireproof Partition Syndicate, of Adelphi. The features of the patent are seen at a glance. The sheets are formed into dovetailed grooves, which form a double key for any plastic material, and make the partition solid, as well as fire, sound, damp, and vermin-proof. Roofs are also made with this patent sheeting, the tiles being embedded in plaster. The partitions are only 2in. thick, and this is a great saving in a large building; while the fire risks and insurance are minimised. Fireproof floors are constructed on a similar principle. This patent is well worth the consideration of experts.

The floor space of the very artistic apartment of the Mosaic Manufacturing Co. (of Pentonville) is covered with Roman marble mosaic and parquetry. Within are examples of Venetian marble mosaic for public buildings, and of parquetry. Specimens are forward of Venetian marble mosaic with curved skirting and slabs for wall lining, and bits of Roman marble mosaic, showing considerable variety in treatment. This section appeals to the artistic taste of architects and decorators.

"Thezzotile" is domiciled in a nice room and in a special position to display the merits of the sanitary decorations furnished by the London Artistic Tablet Company. The wall and ceiling coverings are of enamelled zinc, which is damp proof and a germ killer; while the other wall decorations we saw were on enamelled metal. At all events, "Thezzotile" had a very attractive and withal cleanly appearance.

Patent earth closets for country districts are greatly favoured by the Local Authorities and owners of large works. We were glad to see that Moule's Patent Earth Closet Company were in the hall with models of all their excellent specialities. These closets should appeal to Sanitary Inspectors and public health officers as excellent appliances in districts where water is deficient. Indeed, the appliances of the company are well worth the attention of every village councillor.

Brass and copper work for engineers are the specialities of Wm. Hepton and Son, of Leeds; and they have registered their corrugated copper cylinders free from all loading, with bright polished top.

Architects and carpenters will appreciate the models of the new system of stairs patented by Mr. T. F. Wilkinson. In the new style the angle is designed to combine easier risers with wider treads than can be arranged on the ordinary system. The cottager will now obtain as easy a means of getting upstairs as his rich neighbour. In the model the hand-rails guide the passenger in the centre of the staircase, so that he places his left foot on the left-hand steps, and his right foot on the right-hand steps. There is one more riser on the left-hand side—looking upwards—than on the right-hand side, so that both the ascent and the descent begin with the left foot, as a soldier does in marching. This is a great improvement, and will prevent many accidents, cottage stairs being so steep and uncanny.

Drain-testing is of frequent occurrence, and the City of London Fireworks and Public Decoration Company (of 11, Poultry, E.C.) hold special patents for smoke-cases or rockets for that purpose. These smoke-cases are now in use by the London School Board, and the principal Corporations, District Councils, Sanitary Authorities, plumbers, &c. Many sanitary engineers speak well of them.

A useful sanitary appliance for removing obstructions in closet traps, drains, soil-pipes, and baths is Mr. A. T. Cooper's suction and vacuum pump. This appliance is used where pipes and drains are not blocked to keep them properly cleansed once a month, and for freeing pipes of obnoxious smells. It may be utilised for sudden flushing of drains, and for working on the outlets of any angle required.

The Patent Vulcanite Roofing and Asphalt Company exhibit specimens of their roofing, to which we referred at length at the last Exhibition. The models were much admired, and indeed they attracted as much attention as on the occasion referred to.

A most useful sanitary invention is the cone placed on top of the air-shaft of drains, as described by Mr. Wallace Cadman, of "Crossmyloof," Retreat-road, Westcliffe-on-Sea, Essex. When a wind pressure of 45 lb. to the inch is blowing, it often happens that the zinc or wire tops are blown off. Mr. Cadman's coned perforated covering is of cast iron, and has a tapered socket, and fits into the pipe. Consequently it never blows off, and will prevent nest-building in the pipe and increase the up-draught. Residents living in houses whose pipes are protected with this covering are perfectly secure against sewer gas entering through blockage of the ventilating pipe. Messrs. Thomas Holcroft and Sons, Limited, Wolverhampton, have undertaken the manufacture of the coned perforated covering.

Our readers are familiar with the properties of granite silicon plaster as prepared by the Granite Silicon Plaster Company. This speciality competes with ordinary lime and hair, and, though more expensive, is cheaper than cement plasters. It is favoured very largely by his Majesty's War and Post-office Departments, and is evidently in great demand. One feature is quick setting, the plaster never cracks, sets hard, and dries quickly. Builders should note these points.

The adamantine clinkers of Messrs. Towers and Williamson make an admirable solid sanitary pavement.

They are suitable for stables, coach-houses, yards, kennels, &c. The clinkers were used in the paving of the Royal Mews at Windsor, Sandringham, and Bagshot.

The Kingsland Steam Joinery Works sent several specimens of their manufactures, including closet seats, lavatory fittings, and bath taps, &c.

Aspinall's Enamel, of New Cross, was represented, a neat villa model, entirely decorated with the specialities of the firm.

Jetley's Wood Structures, Limited, had a grand model on exhibition, indicating the utility of their reversible patent structure wood paving. This paving when brought to the street in slabs, tightly joined together by special machinery, and fitted so that no single block can move, and the street cannot go into holes. The blocks are chamfered, and have a beautiful appearance, giving a foothold for horses and preventing slipping. The laying of a street with this new paving, which looks like tiles, takes only a quarter of the time necessary under the old system.

Models showing the application of asphalted roofing, felt, and slag work were exhibited by Messrs. McNeill and Co., of Bunhill-row, and it was a most attractive exhibit.

Bonsor and Co., of Brixton, exhibited a model, with hot and cold water laid on to illustrate the working of the patent "Century" expansion astragal. The firm had on the walls specimens of their patent "Century" lead sockets for rain-water, soil, waste, and ventilating pipes. These were made in various designs, and with ends suitable for soldered, expansion, or slip joints.

Messrs. Oates and Green, of Halifax, made good use of their space to make an effective display of their wares. These comprised bricks of all colours, washtubs, closets, lavatories, sanitary horse-mangers, and sanitary specialities for schools, factories, barracks, and public institutions.

The National Opalite Glazed Brick and Tile Syndicate had the same old diamond-shape office they exhibited two years ago. We understand the company have covered about seventeen acres with opalite tiles in the space of four years. This tile is a great favourite in artistic circles, and always possesses an increased reflection.

Messrs. H. J. and C. Mayor exhibited many specimens of their roofing and ventilated ridge tiles; and Candy and Co. made the most of their display of bricks, terra-cotta blocks, and sanitary stoneware pipes and fittings.

Messrs. James Blezard and Sons, of Padiham, had a show of builders' air grates, hot-water pipes, fittings, and boilers, also specimens of school furniture. The rainproof ventilator is not only the latest, but the leading builders' air brick. It is neat in appearance, and is made to set level on either brick or stone walls.

Special bricks for sewer-work were shown by Messrs. Geo. Tucker and Sons, of Loughborough, who had also in front some excellent specimens of terra-cotta bricks in red and buff, as well as red paving and roofing tiles.

The Somerset Trading Company had a small roof covered with their patent interlocking tiles, which are easily laid without nails, and may be utilised in exposed positions, as they are proof against rain and snow drift. Many bricks and tiles of various shapes and uses were displayed on this small but neat stand.

Shanks and Co. occupied the same bay as in previous years, and exhibited thereon their sanitary specialities.

Ripolin, Limited, had a grand display, showing the application of Ripolin to various materials. The firm exhibited a canvas which had been decorated with Ripolin, which requires no varnish, and also applied to a plaster freize. Doors and panels were treated with Ripolin and liquid gold, and the varied shades of the paints were well brought out on the panels. The stand was very neatly arranged. On one side was a table with many specimens of work and imitation mosaic, and on the other a small office entirely decorated with Ripolin. The firm received two gold medals at the Paris Exhibition.

The Rainwell patent lavatory basin was exhibited by W. F. Mason, Limited, of Manchester. It appears to be well adapted for hospitals, hotels, clubs, &c. The Rainwell requires no plug, washer, chain, lead trap, or overflow pipe, and, of course, the labour and expense involved by the old style is saved.

The Thames Bank Iron Company had a big show in their bay. There were boilers for warming purposes, and also for hot-water services to baths. Then we observed specimens of sanitary pipes and connections, manhole covers and frames, radiators and hot-water materials, rain-water pipes and connections, &c. All these goods were very well arranged, and afforded the visitor ample opportunity for examination.

Mr. H. Hart (of Stepney) had forwarded a nice assortment of his specialities. Every description of drain cleansing machines and tools were there; also brushes, tubes, flues, and pipes. Specimens of his patent spring lock joint were on view.

The Banks Fireproof Construction Syndicate, Limited, occupied some space with several models showing the patent fireproof floor, ceiling, and partitions. With Banks' patent ventilated floor, a current of air is continually passing between ceiling and joist, and is quite sound and fireproof. To prove the strength of the helical metal lathing (which is the only lathing made out of steel wire), about three tons of pig iron were placed on the top it. Specimens of the fireproof corrugated helical lathing and cement were on view, also fireproof partition, with samples of girder, column, and stanchion casing. The models of lift and staircase enclosures are very neat.

Enamels are used for baths and decorations about the house, and Messrs. James Price and Son, of Euston-road, offer "Chez Lui" for both purposes. They also supply metallic enamels and stains, decorators' varnishes, ready-mixed paints, dry colours, &c. The arrangement of the colours and their effect was somewhat attractive.

(*To be continued.*)

The Halifax Board of Guardians last week considered the proposal of the Halifax Corporation to erect a refuse destructor on a site close to St. Luke's Hospital, the buildings which have recently been erected by the Board of Guardians at a cost of nearly £100,000. In the opinion of the Hospital Committee, the destructor would be greatly detrimental to the interests of the inmates of the hospital, and would be a grave danger to the sick, and the Committee recommended the Board to take immediate measures to ensure the proposal being reconsidered, with a view to the destructor being placed in some more remote district. Mr. Balme, in proposing that the minute be referred back, contended that not the slightest smell would arise. Mr. H. Skelton seconded. A refuse destructor had been wanted in Halifax for years, and he could not see that it would be detrimental to the new hospital. Several members spoke in favour of the recommendation of the Committee, holding that if there were any likelihood of anything detrimental to St. Luke's Hospital, another site should be found. The amendment was defeated by a large majority, and a further resolution was agreed to, setting forth the objections to the refuse destructor being placed on the site proposed by the Corporation, with the addition:—"The Board, at the same time giving notice to the Corporation that if the destructor is placed near the hospital, they will have to take steps to protect the interests of the sick as they may deem advisable."

THE SUPERVISION OF DAIRIES, &c.

By James Robert Kaye, County Medical Officer, West Riding of Yorkshire.

The first requirement of Local Authorities aiming at the proper sanitary supervision of cowsheds is the adoption of Regulations under Article 13 of the above Order (see the Model regulations recently issued by the Local Government Board). Experience has proved that those "Models," owing to their necessary general character for the whole country, do not afford that practical assistance to Sanitary Authorities and their officials which is desirable. Absence of reasonable uniformity of action in this matter is conspicuous throughout the West Riding, and this is doubtless due to the want of more definite principles.

An attempt to overcome these difficulties has induced the West Riding Sanitary Committee to authorise the preparation of the following suggestions, which may be regarded only as supplementary to the Model Regulations, not binding in law, and merely indicating what the Sanitary Authority should aim at in promoting the sanitation of cowsheds and the healthiness of the cattle housed therein.

(1) *New buildings, or premises proposed to be newly occupied as cowsheds.*—Under Article 7 (2) of the Order the Sanitary Authority are entitled to one month's notice in writing before any such premises are newly occupied as cowsheds. Before passing the plans for any new cowshed the Authority should see that the materials proposed to be used, and the details of construction, are in accordance with the building bye-laws of the district.

Construction.—The walls should be covered internally to a height of 4ft. 6in. with a smooth impervious material, so as to provide an easily washable surface. The roof should be externally covered with slate or tiles (not corrugated iron, because of the difficulty in regulating temperature, &c.). Gutters or spouts should be provided to carry the rain water to a fall pipe, which should not discharge into the midden but into the surface drainage system so as to avoid dampness of walls and foundations. In places where other water supply is not convenient the rain water might be conducted into a cistern, and used for cleansing the manure channel, floor, &c.

The distance of the cowshed from dwelling-houses, schools, workshops, or public buildings should not be less than 25ft. The cowshed should have two sides at least free from obstruction, so as to admit of free lighting and ventilation. The building should be not less than 8ft. high internally at the eaves. The width or distance between the front and back main walls should be sufficient to allow for a feeding passage between the wall and manger, a trough manger and hayrack, stall, a manure trench, and a cleansing passage. For example, 3ft. 3in. to 4ft. for the passage between the wall and manger; 2ft. for the trough manger and brickwork; 5ft. 9in to 6ft. for the stall; 2ft. to 2ft. 6in. for the manure trench, which should be 3in. deep and carried from one end of the shed to the other; 5ft. to 5ft. 6in. for the cleansing passage.

Where a double row of stalls is wanted, the section might be the duplicate of the above with the exception that the raised passage in the centre for general use might remain at 5ft. 6in. in width. The width of each stall should be about 4ft. for a single cow, and from 6ft. 3in. to 7ft. for a double stall.

The Local Government Board have advised that those cowsheds where the animals are only taken out for drinking purposes cannot be interpreted as coming under Part I. of the Model Regulations, and therefore are not exempt from the requirements of Part II. as to cubic space.

Lighting.—Light should penetrate every nook and corner. To obtain this every cowshed should be provided with windows, or lights in the roof. Three square feet of window space per cow is suggested as a good working average.

Ventilation.—The windows should be so constructed that one-half will open inwards so as to admit air and deflect it upwards above the animals. It is well to provide a number of permanent openings in the walls, so designed that the external aperture is four or five times smaller than the internal orifice. These are placed at about 7ft. above the floor, and the air which enters by such cone-shaped openings becomes readily diffused. Another simple method is to place 2in. tile pipes in the wall near the eaves with 2in. of rise from the outside inwards. Outlets for the egress of foul air should be provided in the roof—or, if there is a loft or ceiling a chimney is desirable. Louvre ventilators may be employed, or the ridge may be elevated and provided with outlets at proper intervals. Roughly speaking, 30 to 40 square inches of inlet area per animal is advisable, while the outlets should be at least equal to the inlets, or, preferably, a little more. The external door should be divided crosswise, so that the top half may be left open when desired. Increased cubic space is of little value without proper ventilation.

Flooring.—The floor of a cowshed should not in any part be below the surface of the ground. It should be properly laid and graded so as to take away all liquids falling upon it. Concrete covered with cement properly furrowed is perhaps the best flooring, because no filth can accumulate in the joints as in ordinary paving. If flags or setts are used they should be laid on a bed of concrete and jointed with cement.

Drainage.—The floor of the standing should have a fall of 2in. or 3in. from the manger to the manure channel, whilst the floor of the channel itself should have a fall outwards of at least ½in. in cross section and a fall longitudinally of ½in. per single stall, so as to drain away the liquids; the floor itself should have a similar fall. The channel should discharge on to a trapped gully outside the cowshed leading to a liquid-manure tank. No covered drain should exist inside the cowshed.

Midden.—A proper middenstead should be provided in accordance with the bye-laws as to prevention of nuisances. Its walls should be made of hard impervious material, and the roof should be supported by means of piers, thereby providing for adequate ventilation and the exclusion of rain. The flooring should also be impervious.

Yard.—The yard and approaches to the cowshed should be properly formed, graded, and paved, to take away the surface water, which should not discharge into the midden.

Manger.—A half-round salt-glazed trough, rising 12in. or 15in. above the floor, is much superior to a wooden tub. A hay-rack immediately over this trough obviates the placing of fodder on the floor. Neither the foddering passage nor any part of the cowshed should be used for the storage of foods. A proper food store should be provided.

Water.—Where the water supply is not derived from a public source, great attention should be given to its protection.

General.—No poultry or pigs should be kept in any part of the cowshed, and it is desirable also that horses and calves should be excluded.

A thermometer in the cowshed is useful.

(2) *Existing cowsheds.*—There are no doubt some buildings used as cowsheds which were not originally constructed for that purpose, and which cannot, except by reconstruction, be made to satisfy even the most elementary hygienic requirements. On the other hand, there are a great number of existing cowsheds which, although not fulfilling all the conditions set forth above, may yet be rendered workable by providing them with

abundance of light, efficient ventilation, impervious flooring, and an adequate supply of water. These essentials can be secured, and should be insisted upon by the Sanitary Authority.

(3) *Register.*—A register should be kept by every Sanitary Authority in which to record the results of periodical inspections. No cowshed should be used for housing a greater number of cows than is specified on the register. Amongst other information locally desirable, the following items are suggested:—(1) Name and address of person registered; (2) situation of premises; (3) owner of premises; (4) number of sheds with size—length, width, height, and cubic space per cow; (5) number of cows in each shed; (6) flooring—material and condition of; (7) walls, material—rough or smooth; (8) water supply—source, position; (9) lighting—number and size of windows or other lights; (10) ventilation—number and size of permanent openings, number and size of openings capable of regulation; (11) midden—distance from cowshed, open or covered, disposal of liquid manure; (12) yard—formation, paving drainage; (13) cleanliness—general condition of floors, walls, midden, yard; (14) general drainage system; (15) disposal of drainage.

LEAD POISONING AND SERVICE PIPES.

The following report bearing upon the prevalence of lead poisoning from water supplies in the district has been presented to the Halifax Town Council by Dr. J. T. Neech, Medical Officer of Health:—

On February 1st of this year I received a communication from Mr. Paskin, the Waterworks Engineer, saying, that it had been reported to him that lead poisoning was frequent in Northowram. I had already had cases reported to me from Southowram Ward, consequently I put myself in communication with all the medical men who practice in Northowram, and also visited the district myself. From the replies I received, and from what I saw myself, I came to the conclusion that the reports were true. One doctor said, lead poisoning had been endemic in Northowram for several years, and another that he thought that three people out of every four would have the blue line round their gums, which is indicative of the presence of lead in the system.

The cause of the plumbo-solvent power of water is the presence of certain peaty acids in solution in the water, and in order to judge of its action on lead, it is of no use to obtain samples of the water from the service pipes and estimate the amount of lead therein, because these pipes hold only a small quantity of water, they may have recently been emptied, or the person in taking a sample throws away that which contains the lead in rinsing out the bottle. The only way, then, to obtain any definite and reliable information as to the plumbo-solvent power of any given water is to immerse lead or lead piping therein for a given period, and then estimate the amount of lead dissolved by the water during that period. This is what has been done in the following experiments:—Half-inch lead piping has been used, and was immersed for a period of one hour. All the calculations are in parts per 100,000.

Through Mr. Paskin, samples of the reservoir water were taken, and the average result of several analyses showed—acidity, 1·01; lead dissolved, ·56.

I also procured several samples of water, as supplied to the Northowram and Southowram Wards, and the average results of the analyses of these samples gave:—

Acidity.	Lead dissolved.
·7	·18

Whenever the acidity of a moorland water reaches ·5, its plumbo-solvent action begins to reach the point of danger to health, and as the acidity rises beyond ·5, the danger increases proportionately. A water, then, giving the above results is dangerous to health, and the foregoing figures are the average of several estimations, in which the acidity varied between ·63 and ·78, and the lead dissolved, between ·15 and ·20, hence the water at times is even more dangerous, and this danger does not exist merely in theory only, but is practically demonstrated among the inhabitants of Northowram. It is true this same water supplies Southowram Ward, and other parts of the Borough, in which there is not much lead poisoning at present, but this is accounted for by the use of longer lead service piping in the Northowram district.

I had several consultations with Mr. Paskin on this subject, and he informed me that the water at Ogden was treated with chalk before distribution. This accounts for the difference in the acidity, and the lead dissolved by the water from the reservoir, and that distributed to the consumers, as shown by comparing the foregoing figures.

I visited the Ogden reservoir and inspected the methods in use there for treating the water. The water, I find, passes through a filter for the purpose of removing all suspended matter therefrom before entering the mains. The chalk is put at intervals into an iron tank, which is divided into two compartments, and is mixed with water in one of the compartments, which water is supplied through perforated piping under pressure. This serves to keep the chalk suspended in the water. The water with the chalk in suspension is then carried by a pipe and mixed with the water flowing from the reservoir, a few feet before it enters the filter.

Chalk, which is carbonate of lime, is quite insoluble in water, hence it is quickly removed therefrom again by the filter, and is therefore not in contact with the water sufficiently long to reduce the acidity below the dangerous point. Had the water in the reservoir a good quantity of carbonic acid in solution the chalk would have been more soluble therein, and probably would have had the desired effect.

These being the facts of the case, I came to the conclusion that it was necessary to supply an alkali that was more or less soluble, in order that it might pass through the filter and neutralise the acidity of the water. Lime is soluble in water in quantities varying from 80 to 90 grains per gallon. I made some experiments with it, and chalk and the two substances combined seemed to give the best results. Hence I decided to add lime with the chalk that was already being put in.

Mr. Paskin had the other compartment of the iron tank at Ogden fitted up according to my request, and on February 28th last we went there together and started the lime process. Consequently since the above date, lime water holding in solution about 23 lb. of lime (about ·75 grain to the gallon) has been discharged into the mains with the chalk solution in suspension in the twenty-four hours.

I have since had several samples of the water as supplied to the consumers taken on different occasions from Northowram, Southowram, and Claremont, and the average result of the analyses thereof gave:—

Acidity.	Lead dissolved.
·31	·037

I am of opinion that these results are highly satisfactory, and if the water be maintained at this standard there will, I think, be no danger of further lead poisoning. The analyses were performed by Mr. Akroyd, the Public Analyst.

The first lady medical practitioner to receive the decoration of the Red Cross in the present reign is Dr. Lillie Savile, whose eminent services under fire at Pekin will be fresh in the public remembrance.

National Health Society.

OFFICIAL TRANSACTIONS.

Examination for the Diploma.—On Tuesday last an examination on "Human Anatomy and Physiology" (for the diploma of the Society) was held at 53, Berners-street, W., by D'Arcy Power, F.R.C.S. The following ladies were successful in reaching the required standard:—Miss E. Olliff, Miss G. D. Bevan, Miss G. Looker, Miss L. Spiller, Miss I. Cox, Mrs. Carol Kelsey, Miss Hall Hall. The first five mentioned of these ladies have now completed their training for the diploma, having satisfied the examiners in all the required subjects.

Elementary Examinations in Oxford.—We have received a most satisfactory report of the result of the examination recently held in Oxford after Miss Hall's work in the county. The examiner says:—"This is on the whole the best class of candidates that I have yet examined. In some cases the written work was of a very high order. There were only one or two who barely passed. They were all successful, and I think much credit is due to the teacher in procuring such average excellency. The practical work was also good."

ASSOCIATION OF NATIONAL HEALTH WORKERS.

The annual course of lectures organised by the Association of National Health Workers, and given in the rooms of the National Health Society, commenced on Monday evening, May 6th. Mrs. Latter (*née* Miss de Pledge), late matron of Chelsea Infirmary, lectured on "Nursing as a Profession for Educated Women." Mrs. Latter weighed carefully the advantages and disadvantages of nursing as a profession, and discussed the different merits of general hospital and Poor Law infirmary training, the methods adopted by different hospitals of admitting probationers for training, the various scales of remuneration to nurses during their training, registration of nurses, necessity of a three years' training, &c. &c. The contrast drawn between the position of a nurse fifty years ago and her status, work, and efficiency at the present time was particularly striking.

On Tuesday afternoon at 3 p.m., Arthur Newsholme, Esq., M.D. (Lond.), D.P.H., Medical Officer of Health for Brighton, lectured on "The Methods of Preventing the Spread of Disease in Connection with Social Life." This lecture was exceedingly practical and useful.

At 5.30 p.m., on the same afternoon, Miss Alice Busk lectured on "Women as Sanitary Inspectors." As it is hoped that these lectures will be fully reported later, they will not be further summarised in this column.

Pudsey.—The annual report issued by Dr. W. L. Hunter, Medical Officer for Pudsey, gives the population of the borough as 14,909. The birth-rate for the year has been 25·3 per thousand, and the death-rate 14·9. A rapid decrease in the death-rate has been going on since 1880; but this has been more particularly noticeable in the zymotic and phthisis death-rates. There has been at the same time, however, an equally steady decline in the birth-rate, from 46·31 in 1837 to 25·3 in 1900. The Doctor compliments the Council on the good work they have done in recent years, and recommends more energy in scavenging, in clearing away insanitary dwellings, in the improvement of private streets, in the adoption of the water-carriage system, and in the provision of public baths and a public slaughter-house. The report is illustrated, and contains interesting statistics as to mortality and population since 1837.

LAW CASES.

Trade Refuse in Sewers.

An important appeal came before the Master of the Rolls, Lord Justice Vaughan Williams, and Lord Justice Romer last week in the Court of Appeal. It was the case of the Attorney-General on the relation of the Sevenoaks Rural District Council and the Sevenoaks Rural District Council *v.* Whitmore, and was an appeal from a judgment of Mr. Justice Mathew. The relators and plaintiffs were the Local Sanitary Authority for the parish of Edenbridge, and the defendants, Messrs. T. and H. Whitmore, were the owners of a tannery in that parish.

The plaintiffs claimed an injunction to restrain the defendants from causing or permitting the effluents from their tannery to flow into the sewers of the plaintiffs, on the ground that such effluents were of so offensive and dangerous a character that they caused the effluent flowing from the plaintiffs' sewage farm into the river Eden to be a nuisance to, and injurious to the health of, the inhabitants of the parish of Edenbridge and the persons living near the river Eden. The plaintiffs further contended that the tannery effluents contained free alkalinity to an extent which rendered them a liquid which would "prejudicially affect the application to land" of the sewage matter conveyed along their sewers, within the meaning of Section 7 of the Rivers Pollution Act, 1876 (39 and 40 Vict., c. 75), and that consequently they were not compelled to receive such effluents into their sewers. The defendants contended that the plaintiffs were bound to continue the admission into their sewers of the effluents from the tannery, and that the nuisance, if any, was caused by the inefficient state and unskilful management of the sewage farm: and they alleged that the tannery effluents were as capable of being dealt with by bacterial treatment as ordinary sewage, if the sewage farm were properly managed. It appeared that in 1875, when the Local Authority constructed a system of sewers leading to settling tanks and thence into the river Eden, the defendants had received a notice requiring them to connect their tannery with the sewers of the Local Authority, which they had done. In 1886 the present system of sewerage was constructed; and, before connecting themselves with the new system, the defendants, at the request and under the supervision of the Sanitary Authority, erected settling tanks upon their own premises. Upon the completion of this work the Sanitary Authority agreed to admit, and admitted, the tannery effluents into their sewers. Dr. Voelcker and Mr. Thudichum were called on behalf of the plaintiffs, and stated that, in their opinion, the tannery effluent contained alkalinity to so great a degree that a liquid resulted which prejudicially affected the application to land of the sewage matter conveyed by the plaintiffs' sewers. Mr. Strachan, Mr. Frank Scudder, and Mr. Santo Crimp, who were witnesses for the defendants, were of opinion that the effluent of the tannery, in which no chemicals other than vegetable acids and lime were used, in no way prejudicially affected the application of the sewage to land, inasmuch as a considerable quantity of the free alkalinity was reduced by carbonic acid from household sewage in the plaintiffs' sewers and the settling tanks at the sewage farm. They also considered that, owing to the sewage farm being on a clay soil and under-drained, the sewage matter found its way through the cracks in the soil into the under-drains, unaffected by the bacteria on the surface, and so passed in its crude state into the river. The action was tried before Mr. Justice Mathew, sitting with Mr. Baldwin Latham, C.E., as assessor. The learned Judge gave judgment for the defendants. The plaintiffs appealed.

Mr. Witt, K.C., and Mr. Morton Smith, appeared

for the plaintiffs; Mr. Dickens, K.C., Mr. G. F. Hohler and Mr. C. M. Pitman, for the defendants.

The Court, without calling upon counsel for the defendants, dismissed the appeal.

The Master of the Rolls said he had come to the conclusion after reading the whole of the evidence that it was impossible to say that the judgment of Mr. Justice Mathew was wrong. The real cause of action in this case was founded on Section 7 of the Rivers Pollution Act, 1876. That section conferred a benefit on persons carrying on trade—namely, a right to drain into the public sewers. It enacted that "every sanitary or other Local Authority having sewers under their control shall give facilities for enabling manufacturers within their district to carry the liquids proceeding from their factories or manufacturing processes into such sewers. That was a statutory right given to manufacturers. But it was subject to a limitation. The section proceeded, "Provided that this section shall not extend to compel any Sanitary or other Local Authority to admit into their sewers any liquid which would prejudicially affect such sewers or the disposal by sale, application to land, or otherwise, of the sewage matter conveyed along such sewers." Here the plaintiffs, who were a Local Authority, said that the defendants, who carried on the trade of tanners, although they had a *primâ facie* right to drain the liquids coming from their tannery into the public sewers, yet ought not to be allowed to do so because those liquids were injurious to the application to land of the sewage matter conveyed along the sewers. They said that the effluent from the tannery was such that when it came on to their sewage farm it killed the microbes which otherwise would have got rid of the impurities in the sewage. The whole issue was whether that was true. There was a large body of evidence given at the trial on one side and on the other, and that evidence was very complicated; the expert witnesses who were called not only giving evidence quite inconsistent with one another, but some of them giving evidence in cross-examination which was quite inconsistent with what they said in examination in chief. The defendants' point was that the cause of the microbes being killed was not the effluent of their tannery, but the method which the plaintiffs adopted of managing and working their sewage farm. Mr. Justice Mathew considered that point, and thought that it was made out, and he gave judgment for the defendants. There was no ground whatever for interfering with his decision.

The Lords Justices delivered judgment to the same effect.—*The Times.*

Liabilities of an "Owner" to abate Nuisances.

In the King's Bench Division, of the High Court of Justice, the Lord Chief Justice of England and Mr. Justice Lawrence had before them the case of Broadbent *v.* Shepherd. An appeal by way of special case from the decision of justices for the West Riding of Yorkshire, on a complaint laid by the appellant, on behalf of the Castleford Urban District Council, against the respondent, as the statutory "owner" of certain premises in the district, and alleging failure on the part of the respondent to comply with a notice served on him under Sec. 94 of the Public Health Act, 1875, requiring him to abate certain nuisances on the said premises.

The complaint originally came on before the justices on June 27th, 1900, when it appeared that the nuisance existed and was due to structural defects, but that the respondent was a mere rent collector or agent for the real owners of the premises. The justices were of opinion that though the respondent was "owner" of the premises within the definition of that term in Sec. 4 of the Public Health Act, 1875, it was not the intention of the Act to create two ownerships under Sec. 94, and that the definition of "owner" did not apply to the interpretation of that section; and they therefore dismissed the complaint. On the application of the appellant, they, however, stated a special case on the point for the determination of the High Court. On November 15th, 1900, the High Court ordered that the decision of the justices should be reversed, and remitted the case to the justices with an intimation that a rent collector or agent is an "owner" for the purposes of Sec. 94 of the Public Health Act, 1875. On December 5th, 1900, the complaint, having been reinstated in accordance with the decision of the High Court, again came on for hearing. It then appeared that the respondent had, since the last hearing, resigned the agency of the property. The justices were urged by the appellant to make an order on the respondent to abate the nuisance. They, however, were advised that they had no power to make an order on the respondent, on the ground that such an order can only be made on a person who is an "owner" of the premises when the order is made. They accordingly dismissed the complaint, subject to the present case.

Mr. Macmorran, K.C., and Mr. Scholefield appeared for the appellant; the respondent was not represented.

The Court allowed the appeal.

The Lord Chief Justice said that when the case was originally before the Court, consisting of Mr. Justice Kennedy and himself, the Court had held that the justices ought to have made the order, because the person against whom it was sought was "owner" of the premises within the definition. He would assume that that order would have been an order to abate the nuisance within a given number of days. What had happened was that at some time after the first hearing before the justices the agent had ceased to be agent. If the sole object of the order sought were to obtain a personal remedy against the indivdual, though even in that case he would not express the opinion that an order could not he made, different considerations would arise. In that case it might be said that the order would be a mere empty order and ought not to be made. But when Secs. 96, 98, and 104, were looked at it appeared that one object of the order, among others, was to found the right of the Local Authority to enter the premises, do the work, and recover the expenses from the person responsible. The justices had originally jurisdiction, as the Court had decided, to make the order on the agent; and, in his Lordship's opinion, when the case went back to them they should have made the order they ought to have made in the first instance, unless, as was not the case, that order would have been wholly nugatory. The case must be remitted to the justices accordingly.

Mr. Justice Lawrence concurred.

MUNICIPAL ENGINEERING & SURVEYING.

CROSS-TABLE CHAT.

The post of City Engineer to the Corporation of Cape Town, South Africa, which is again vacant, and for which applications had to be sent by May 2nd is, I find, being considerably sought after by English engineers. The salary is £1000 per annum, which, on the face of it, appears tempting, but it should be borne in mind that owing to the high cost of living, house rents, &c., this amount is not nearly equal in value to a similar salary in England. I think it is due to candidates for the office that they should be aware of the fact that the conditions under which the City Engineer of Cape Town holds his appointment are the reverse of being satisfactory or bearable. The members of the Corporation are mostly of Dutch descent, and are, I regret to say, intolerant and highly inconsiderate to officials, and their views of their own powers and the

functions of the Engineer are singular in the extreme. Few engineers can endure the strain of worry and disagreeable work under the Cape Town Municipality, and in evidence of this it should be observed that the appointment is vacant at intervals of every two or three years.

At this period of the year, the members of Local Authorities influenced by the requirements of their constituents or the advent of summer are infected with a zeal for the establishment or enlargement of public baths and discuss the question at Council meetings until the season—when the British youth yearns for swimming— is over, when it is adjourned until the succeeding season comes round. Occasionally, of course, the result of the controversy is that public baths are erected, when the Surveyor is required to prepare plans for such buildings, and superintend their erection. It must be said that the average Councillor is rarely an enthusiast for public baths, owing to the fact, which is indisputable, that such baths are never self-supporting, but the cost of their maintenance always becomes a charge on the rates. Of course it is argued that they are beneficial from a sanitary point of view. To some extent this is true, but not to the degree which is generally advocated. Moreover, if Local Authorities are to be made responsible for the cost of maintenance of every *quasi* sanitary measure, the end will never be in sight. Inasmuch, however, as the practice of providing such baths at the expense of the rates has been established now in a considerable number of towns, it has to be generally followed in all urban districts.

For the information of surveyors and architects, I may state that the literature on the subject of public baths is exceedingly small. There is only one independent volume published, which is Allsop's "Public Baths and Wash-houses," price 7s. 6d. It is sensibly written, and contains valuable suggestions which ought to be fully considered by every architect who has to design such buildings. It does not, however, as might be expected at the price, contain many plans, and those which are given are applicable to large towns only.

One of the cheapest public baths for small towns which I remember to have seen is that built a few years ago at Market Harborough by the District Council from the designs and under the superintendence of their excellent Surveyor, Mr. Harold G. Coales. The area of the bath is 75ft. by 25ft., and four slipper baths are also provided, the total cost only reaching about £2300. I commend this building as a model to surveyors who have to design baths for any town with a population under 20,000.

The difficulties of providing cheap housing accommodation for the rural population is nowhere more keenly felt than in the southern and eastern counties of England; and it appears that in Essex especially, brick-built houses, if constructed according to the requirements of the Model Bye-laws as to new buildings could not be let to tenants able to pay such a rent as would yield an average rate of interest to the building owner, so low are the incomes of the wage-earning class. Cottage building is in consequence at a standstill in those districts in which the Model Bye-laws are in force and gross overcrowding exists in old properties.

The Rural District Councils are endeavouring to meet the difficulty by obtaining the approval of the Local Government Board to building bye-laws which shall permit the erection of cottages built of timber framing, and a draft of such bye-laws has been sent to me. I believe that Messrs. Dewhirst and Keywood, the Surveyors to the Chelmsford Rural and the Maldon Rural District Councils respectively, are jointly responsible for the preparation of the proposed bye-laws, and I may here observe that they are to be congratulated on the care and discrimination which they have exercised in the work.

The most important clauses introduced are those having reference, of course, to dwellings built of timber framing. These are classed as "practically exempted buildings," and are to be exempt from the operation of the clauses relating to thickness of walls, mortar, incombustible materials, height of storeys, party walls, &c. These clauses provide that "Any building not exceeding in area 700 square feet and not exceeding 20ft. in height, measured from the top of the footings to half the vertical height of the roof, built of timber framing not less than 4in. by 3in., properly put together and resting on brick footings not less than 12in. out of the ground, and similar in every respect to the footings required for a 9in. external wall, the timber framing of such building to be covered externally with weather boarding, lath and plaster, expanded metal and plaster, tiles, or corrugated iron, and covered internally with lath and plaster," and "any building not exceeding an area 700 square feet and not exceeding 20ft. in height, measured from the top of the footings to half the vertical height of the roof, the external walls of which so far as the first storey shall be of brick, stone, or other hard and incombustible materials, properly bonded and solidly put together, and not less than 9in. in thickness, the second storey of which is constructed of timber framing, covered with weather boarding," &c., as in the previous clause.

With these clauses are provisos that the term "building," as used above, shall not comprise more than two dwelling-houses, and shall be distant at least 15ft. from any adjoining lands or premises, and also that in every case where the building comprises two dwelling-houses the party wall shall be of brick or stone not less than 9in. thick throughout, the party wall shall project 1in. beyond the face of the external walls, and no timber or woodwork shall be placed within 4½in. of the centre of such party wall.

These clauses, it will be seen, are a radical departure from the present "models," and it remains to be seen whether the Local Government Board will approve them. One would suggest that the distance of 15ft. should be extended so as to prohibit such buildings being erected within 15ft. of any street, and it appears to me that the party wall of such building which has to be constructed of brick or stone may be put together as "dry walling," that is, without mortar or cement, as such buildings are proposed to be exempted from the operation of Clauses 12 and 13, which apply to mortar, &c. This is doubtless an inadvertence which should be corrected before final approval. It is also undesirable to prescribe the materials in the manner suggested, as there are several other methods of covering the timber framing, and doubtless many others will be forthcoming which may be superior to those suggested, but which could be prohibited under the bye-laws as drafted. Inasmuch, too, as both steel and iron framing are being introduced for walls of houses, partitions, &c., which is much superior to timber framing, provision should be made for the alternative use of such material.

I hope to be able to advert to the subject in the next issue. There are numerous rural surveyors who are deeply interested in the alteration of such bye-laws, and to those I may state that Mr. Dewhirst, Surveyor to the Rural District Council, Chelmsford, or Mr. Keywood, of Maldon, will, on application, forward a copy of the draft bye-laws.

Senex.

NOTICES.

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The Sanitary Record

AND

Journal of Sanitary and Municipal Engineering.

MAY 9, 1901.

A LESSON TO RAILWAY COMPANIES.

IN rejecting the London and North-Western Railway Company's Bill last week, the House of Commons read a severe lesson, not only to it, but to all other railway companies concerned in the execution of railway works involving the displacement of population. The companies will now perhaps understand that Parliament expects that its intentions with regard to re-housing, and not merely the strict letter of the law, will be complied with. The course adopted was a very unusual one, and may no doubt cause temporary inconvenience to certain localities, but the effect of the lesson will be most salutary. The question arose over a proposal in the Bill before the House to take power to acquire land in Hammersmith for purposes of extension. At once Mr. Hay, the member for Shoreditch, Hoxton, brought up the evasion by the company of their obligations to re-house the people displaced by their operations under former measures; and though he was not allowed by the Speaker to enter into the past misdeeds of the company, as not being germane to the present Bill, he had the feeling of a very large section of the House with him in proposing the rejection of the Bill as a mark of disapproval of the company's conduct. The company, it was made clear by Mr. Ritchie, has been in conflict with the Home-office as to their re-housing obligations. As Mr. Macnamara aptly reminded the House, Mr. Ritchie had just been forced to threaten the company with a writ for £16,000 for its persistent evasion of these obligations. The contention of the company is that in providing new dwellings for those cleared away for railway purposes, it is not bound to provide dwellings suitable to the class disturbed. Mr. Ritchie therefore suggested that a Committee might be appointed to consider the model clause relating to the housing of the working classes, in order to increase its stringency. The proposal met with unanimous approval, and obtained the assent of the promoters of the railway company's Bill. The promoters also acquiesced in Mr. Ritchie's suggestion that the obnoxious Hammersmith clauses should be withdrawn, but even this concession was not sufficient to allay the deep feeling of dissatisfaction in the House with the company's past record. The member for Battersea, as might have been expected, was characteristically caustic. "The Home Secretary," said Mr. Burns, "seems to have been wrestling with wild beasts at Ephesus." ("At Euston," interpolated Mr. T. W. Russell.) The directors, he said, had defied the Home Secretary. "Not I," interrupted Colonel Lockwood. Mr. Burns's retort was prompt. Precisely, he said, Colonel Lockwood was a soldier and understood strategy, but the House was only interested in one kind of strategical movement on the company's part, and that was a movement to the rear. On a division the Bill was rejected by a small majority. The action of the House could not be defended as logical. The Bill itself, when lightened of the objectionable clauses, was not intended to be condemned. The vote was simply intended as "a protest against the domineering of the great railway companies," who in the plenitude of their power think they can disregard the intentions of Parliament with regard to the housing of the working classes.

Child Labour in Dundee.

MR. ROBSON'S Half-Timers Act is to be followed by a measure having a similar object for Scotland. The Government took up the question of raising the age in Lord Balfour's Education Bill last year, which had unfortunately, owing to lack of parliamentary

time, to be dropped; and now Mr. Pirie brings forward a private member's Bill with the same end in view. Mr. Pirie's Bill—which was read a second time last week—is full of defects and anomalies; but the broad principle on which it is based, that the school age should be raised, obtained the hearty support of both sides of the House. It is, indeed, unexceptionable. The Lord Advocate explained, in the course of the debate, that the position of Scotland and of England on the half-timer question was quite different. Except in Dundee and Paisley, the system had practically disappeared, and it was fast dying a natural death. But in Dundee, the most important centre of the half-time system in Scotland, where the children are employed in the jute mills and factories, the condition of things appears to be particularly bad. Mr. Tennant quoted from the report of Mr. Wilson, the Inspector of Factories, who came to the definite conclusion that these children in Dundee were perhaps more diminutive than were to be found in any part of the country. They lost flesh and colour. They put on little weight, and grew very slowly. And the worst of it is that in going into the mills at this early age they have not even the advantage of learning a trade; for at the age of fourteen or fifteen they leave the factory, and go to swell the ranks of casual labour; and at sixteen or seventeen they often have no employment at all. It was a most sombre picture that Mr. Tennant drew, unrelieved by a ray of light. He stated that the situation in Dundee was so bad at present that it had attracted the attention of the manufacturers, the Medical Officer of Health, and the Town Council, who, he understood, were going to take the question in hand. The state of things has also other consequences equally disastrous. Mr. Tennant explained that the result of the children leaving the mills sapped of their best vital power and without having learned a trade was that the number of unemployed men in Dundee living on their wives had become a byword; and, further, that there was a large amount of mortality among women in Dundee owing to this fact, that their husbands could not or would not work, and that the burden of the work consequently fell on their shoulders. The situation he characterised to be almost beyond the dreams of degeneracy, full of gravity and danger to the State. Such, then, are some of the results of the half-timer system where it has been in full force. The system is doomed, and the sooner it is helped to its grave the better.

Re-vaccination in Glasgow.

Some interesting figures in connection with small-pox epidemic in Glasgow were furnished at a meeting of the Town Council last week. The vaccination obstructionists—happily a very insignificant minority—have been most persistent in their efforts to throw discredit on the measures adopted by the Health Department. One of them, Mr. Shaw Maxwell, has been pressing for returns to show the number of patients admitted to hospital who had been vaccinated, and at the meeting referred to he drew attention, with an air of triumph, to these returns. They showed that of the admissions during the past month 119 had been vaccinated, 6 were unvaccinated, 4 were doubtful, and 19 had been re-vaccinated. He referred to these figures as disproving a recent statement of the Lord Provost, made on the authority of the Medical Officer, and previously quoted in these columns, that there had been absolutely not a single case of small-pox where the patient had been re-vaccinated, whereas the returns showed that there had been at least 19 such cases. The Lord Provost had no difficulty in at once putting him right. In every one of those 19 cases re-vaccination had taken place within the period of incubation, and therefore the figures bore out exactly and literally the Medical Officer's former assurances. Mr. Dick, Convener of the Health Committee, mentioned the interesting fact that they had actually re-vaccinated 302,000 persons since January 1st, and he said he had been congratulated on all hands that the city of Glasgow was in a position no other community in the kingdom was in. The record is certainly a very creditable one.

Quiet Work at Bradford.

We congratulate the Bradford Sanitary Association on the issue of its nineteenth annual report. Like kindred organisations it does its work quietly, but none the less effectively. In the year reported upon special attention has been given to one particular phase of the food question. "Our object," says the report, "is to improve the food of the people. Food is that necessity of life which is paramount to all others. It is absorbed in three forms; that is, we take solid food, liquid food, and air food. Poison may enter into any one of our three foods, and terminate our existence more or less summarily; reason would say, it matters not which. Yet such is our unreason that the death of a few unlucky beer-drinkers, to be counted by units, who have loved their cup too well and have imbibed deadly poison with it, and whose lives are but as a few drops in the tide of death, creates greater consternation than the perennial flood which, day by day and year by year, carries down its thousands of victims from the poisoned air food we consume. On a fair computation, not more than one householder in a hundred regards the purity or impurity of this kind of food as of the least personal importance, and even of this select few three-fourths cannot carry their scruples beyond the four walls of their own dwelling; the air of their places of business is indifferent to them. It is this air food we wish to improve. We wish to rivet the attention of our neighbours not only on the penalty of disease and death we pay for poisoning it, but on the lack of refinement it involves. Until we are as careful about our air food as we are about our bread and water, we cannot claim to be much superior in cleanliness to the humblest creature that lives in the open air." How true this is every health-worker knows. The utter carelessness of many to the purity of their surroundings,

is the greatest difficulty met with on every hand and when such are persuaded of the necessity of fresh air in the home and the workshop, all other advance becomes easy.

The Women's Memorial.

We suppose it is inevitable that a number of appeals must be issued for the establishment of memorials to our late beloved Queen. The Lord Mayor, of course, would desire that all should give their support to the great national tribute, on behalf of which he appealed a few weeks ago. But there are those who would rather support a movement for the alleviation of suffering than the erection of an immense monumental structure. To such the proposals made at the meeting held last week at the residence of the Marquis of Londonderry should come with irresistible force. No better work has ever been done than that which the late Queen inaugurated when she handed over the women's jubilee offering for the establishment of the Jubilee Institute of Nurses. How greatly this institute has prospered may be gathered from one fact alone—that last year its nurses paid no less than four million visits to the sick poor in all parts of the kingdom. But its good effect is not confined to its own work. Other institutes have been established, and the country is fast being covered with a great network of nursing organisations, which is doing more than anything else to prevent suffering and give help to the helpless. We know of no better means to commemorate the life of Victoria the Good than the strengthening of this beneficent work. Most branches are able to collect enough funds for the carrying on of their operations, but in scattered rural districts this is impossible, and the "endowment fund" it is proposed to raise will enable the Central Council to help such cases. We heartily commend the project to the women of Great Britain.

Sanitary Affairs Dominant.

We have often been struck at the great contrast in the treatment of sanitary affairs between the home and colonial and Indian papers. The contrast, perhaps, is most remarkable as regards the "big London dailies." The ordinary administrative routine of the metropolis receives but little notice in their pages. Of course, if there is anything like the housing question, out of which political capital can be made, notice is taken of it, and it is run for all it is worth —from the party point of view. If abstract theories on water supply, or sensational statements of the shortcomings of the water companies, are thought likely to influence a few votes, then these also are given prominence. But for a London daily to give three or four columns to a report of the proceedings of the London County Council or one of the metropolitan boroughs—why, such a thing is unknown. And yet the sanitary administration of the county is of more vital import to the inhabitants than the columns of simple nothings which go so largely to fill up the paper every day. Fancy the editor writing a leader on the proceedings of the Sanitary Authority! But in many of our Colonies this is just what does take place. The editors know full well that healthy conditions of life are the greatest problems before their readers, and every phase of administrative life is closely watched and duly commented upon. The effect of this cannot be over-estimated. Officers, Councillors, Aldermen, and all in authority, soon realise that their conduct of affairs is being closely watched, and only good can be the result. If the boroughs of London are ever to equal the provincial cities in enterprise and efficiency, the Press will have to take its share in bringing them up to the standard, and the great daily that is prepared to devote a considerable portion of its space to "bread-and-butter politics" will be the leader in the march of progress.

A Great Reservoir.

Last week a large company assembled at the invitation of the Southwark and Vauxhall Water Company to inspect the new works at Hampton and Sunbury, and to take part in cutting the first sod of an immense new reservoir at Walton-on-Thames. The Riverdale engine-house at Hampton was first visited, and great admiration was expressed at the three sets of magnificent expansion engines, which have recently been erected. Each engine is capable of pumping nine million gallons per day to a height of 280ft. They were designed by Mr. J. W. Restlar, the company's engineer, and made by the North-Eastern Marine Engineering Company. In striking contrast were the old Cornish engines, which are still doing duty. After inspecting the filter beds, the company went on to Walton, where a new storage reservoir is to be constructed by Messrs. John Aird and Co. When completed it will hold 1076 million gallons, and be one of the largest in the kingdom. The first sod was cut by the chairman of the company, Sir Henry Knight, who, at the subsequent luncheon, gave some interesting particulars of the company's operations. It supplies an area of forty square miles, with an estimated population of 837,207 in 124,770 houses. Last year the maximum quantity of water supplied on any day was 38 million gallons. To meet this demand there were filter beds sufficient to deal with 58½ million gallons, and pumping power capable of raising 78 million gallons per day. As to storage, the existing reservoirs were capable of holding 400 million gallons, and when the new reservoir was completed they would have no less than 1512 millions of unfiltered water and 71 millions of gallons of filtered water, making in all 1583 millions of gallons. Thus the company would have a storage sufficient for 56 days' supply without taking a drop of water from the Thames. Considering the magnitude of the works in hand by the other water companies, it was but natural that Sir Henry should "point a moral and adorn a tale." With the companies so fully alive to the needs of Londoners, why the necessity for the County Council to talk of spending millions in getting a water supply from Wales! Perhaps not, but if the County Council had never had its "tall

talk," there are many who think that the companies would have gone on in the old way and demonstrated their inability to realise that they had a duty to perform as well as "a dividend to pay." That something was needed is proved by the fact of Sir Henry Knight's own company quadrupling its storage capacity.

CORRESPONDENCE.

(*To the Editor of* The Sanitary Record.)

(*We do not in any way hold ourselves responsible for opinions expressed by our correspondents.*)

THE PLUMBERS' COMPANY AND THE REGISTRATION OF PLUMBERS.

Sir,—In reference to the correspondence on the above subject in your columns, can the Plumbers' Company, their solicitors, or anyone else, enlighten me as to the objects of the present registration movement?

At a recent meeting in Bury, if newspaper reports can be trusted, the following resolution was passed:—

"That this meeting approves of the present voluntary system of registration of plumbers *in the interest of the public health, and recommends that all plumbers' work in the district be done by registered plumbers.*"

The portion in italics is excellent on the face of it, but what guarantee has the public as to the efficiency of the registered plumber? That he earns the standard rate of wages of his district?

At the meeting at which the above resolution was passed, I understand that the secretary mentioned that under the old registration movement at least 50 per cent. of the candidates failed in the examination entitling them to registration—presumably on account of inefficiency. These 50 per cent. are now to be registered because they are master plumbers, or because they earn the standard rate of wages, and are to carry out work in the interest (?) of the public health!

According to a report of the Bury meeting, the Chairman stated that "it was insisted upon that chemists should pass theoretical and practical examinations, and that they should be in every way competent, but when it came to the plumber, who had the lives of all of them in his hands . . . they did not take the slightest notice . . . ." What would the chairman and a great many other people say if the chemists' examinations were dropped, and any man considered qualified because his master chose to pay him the usual rate of salary?

Apparently, the Plumbers' Company has gone back to its original procedure of registering anybody and everybody—a practice which the Company itself condemned, and to remedy which it instituted the examinations now discarded.

Personally, I should say, either register men who can be guaranteed efficient and upon whom the public can place confidence, or do not "recommend that work be done by registered plumbers in the interests of the public health," which latter, under present circumstances, is, to say the least of it, a farce.—Yours truly,

Examinations.

The Public Health Committee of the London County Council has received a report from Dr. Hamer concerning the outbreaks of enteric fever last September in Southwark (where there were 100 cases), in Lambeth (where there were about fifty cases), and in Kensal Town (where there were about thirty cases). In Dr. Hamer's opinion there are grounds for the suspicion that in Southwark and Lambeth the disease resulted from the consumption of fried fish received from particular shops.

Sanitary Inspectors' Associations.

LONDON.

The Council of the Sanitary Inspectors' Association have pleasure in announcing that the summer meeting and congress usually held in the provinces will this year take place in London, and it is understood that the City Corporation have kindly placed exceptional facilities at the disposal of the Association. An early announcement will be made of the date and particulars of the arrangements.

An ordinary meeting of the members of the Sanitary Inspectors' Association was held on Saturday last at the Carpenters' Hall, London Wall, E.C. Mr. W. H. Grigg (Fulham), the chairman of the Council, presided, and those present included Messrs. W. W. West, I. Young, McNair, Nurcombe, Warwick, T. G. Dee, Jordan, Morley, Henley, S. C. Legg, Dawes, Pettit, Wilkinson, Nessfield, E. Tidman, C.E., the hon. secretary, &c.

Mr. J. S. Dunn, fomerly of Poplar, but now Sanitary Inspector in Bulawayo, South Africa, forwarded a paper on "Sanitation in South Africa," and this was read by Mr. O. C. Hills. The author remarked that although his paper was entitled "Sanitation in South Africa," after hearing it, he was afraid they would be of the unanimous opinion that South Africa generally is a country without sanitation. In many respects the colonists were pioneers, and were carrying civilisation far into the interior of the Dark Continent, but they could not yet claim to be pioneers in public health administration. Owing to the disturbed state of the country on account of the war, it had been impossible to obtain all the statistical information which was desirable, and he was forced, therefore, to confine himself to the two towns with which he was intimately acquainted, viz., Cape Town and Bulawayo. As the first named was the oldest town of any importance, and the last named the youngest, a comparison between the two would not be without interest. Extracts from the Blue-book on the health of the colony in 1899 would cause them to open their eyes with astonishment at the very primitive methods still in vogue in many colonial villages. Cape Town and its suburbs had a population of about 165,000, and was charmingly situated. Two distinct schemes of drainage were now approaching completion, one for sewage and the other for storm water. The separate system was necessary owing to the excessive rainfall during a few consecutive months of the year. The ventilation of the sewers was effected by cast iron pipes, carried up the houses from the sewer side of the interceptor. Seapoint, an adjoining suburb, had adopted the water-carriage system, and the only other towns which had done so were Durban (the most advanced town in South Africa), Pietermaritsburg, and Port Elizabeth. Cape Town's water supply was from springs on table mountains, and extensive reservoir accommodation had been provided and was being increased, so that there should be an abundance of water for flushing purposes in addition to that for domestic use. The water was of good quality. Scavenging was done departmentally, all garbage and dirt being collected daily. Although the sanitary condition of Cape Town was yearly improving it would be some time before it could be favourably compared with a town of similar size and importance at home. Roads and gutters require much attention; the subsoil was in places frightfully polluted with slop and kitchen water; much slum property existed, and as house rent was high overcrowding was prevalent. The Malay community were dirty in their habits, and their customs and religious practices required thought and tact to

enable them to be dealt with successfully. Bulawayo was 1360 miles inland and 4000ft. above sea level; it was the capital of Matabeleland; the township was just six years old. Practically no attempt had been made to construct proper roads. Bulawayo was the nucleus of a large and flourishing city. Its present population was about 4000, the town was laid out in geometrical lines, the avenues being at right angles to the streets; the former were 100ft. wide and the latter 125ft. There were 1450 building plots, averaging 140ft. by 100ft., and these had sanitary lanes at the back for rubbish and night-soil wagons to pass along and perform their various functions. A park separates the towns from the suburbs, and here the stands or building plots were 300ft. by 200ft. with roads back and front. The pail system was in vogue for the removal of night-soil, and the work was performed nightly—an advantage which no other South African town enjoyed to the author's knowledge. The work was carried out departmentally, clean disinfected buckets being provided twice a week. The night-soil was conveyed to the municipal depositing site about three miles from the town, emptied into trenches, which were then prepared for tree planting. Rubbish, slop water, and dead horses were removed by the Council, but the system did not work quite happily. Large and offensive accumulations were not an unknown factor. The removal of slop water was the burning question in Bulawayo, as it is in the majority of South African towns. The town only had surface drainage, and the usual way of disposing of slop water was by scattering it over the building plots. Thus the subsoil was being polluted wholesale, and the purity of the well water was endangered. There was the waterworks company, but, owing to the fluctuating quantity of the water available, its variable quality, and high tariff, the demands on the company were not great. Moreover, 350 wells had been sunk in the township, and their use would not be abandoned for trifling reasons. It was regrettable that more care was not exercised in selecting their positions and in their construction, so as to guard against pollution. There was every opportunity offered for the entry of surface water and foreign matters at the mouth of the wells, and contamination by percolation from closets, dustbins, stables, washing water, &c., was easily accomplished. The Council recognised the necessity of obtaining a wholesome and abundant supply, and the matter was receiving earnest attention. In the meantime all doubtful well waters are being carefully analysed. With the exception of typhoid fever there was remarkably little infectious disease. It was well that it was so, because an outbreak would find the town very unprepared. The lazaretto was unfurnished, dilapidated, and without means of disinfection. Notification was compulsory, but there the law as regards infectious disease practically ended. At present they were preparing for the importation of the bubonic plague. There was, fortunately, no slum property. The slaughter site was unsatisfactory in the extreme, and the bye-laws were very incomplete. These matters would probably be rectified in the dim future, and the Council was negotiating for a loan for general improvements. Mr. Dunn then gave a number of quotations from the reports of district surgeons in various parts of Cape Colony, showing the dreadfully insanitary condition of their districts and the supineness of the Authorities in making proper provision; and in concluding he quoted the leading article which appeared in THE SANITARY RECORD of 28th December last, showing the excellent opportunities for municipal engineers and health officers in South Africa when the war is over.

On the motion of Mr. WEST, a hearty vote of thanks was accorded to Mr. Dunn for his paper, and to Mr. Hills for its delivery, and in the course of the brief discussion which followed, the hope was expressed that the facts related by Mr. Dunn as to the insanitary condition of many South African towns would be brought to the notice of the various Governments concerned.

Mr. HILLS acknowledged the compliment.

Mr. WARWICK (West Ham) then opened a discussion with an address showing the difficulties connected with the protection of food supplies in many towns and boroughs, and further consideration of the matter was postponed.

The usual vote of thanks to the chairman closed the proceedings.

NATIONAL UNION.

THE quarterly meeting of the members of the National Union of Sanitary Inspectors was held at the Shirehall, Stafford. Mr. W. Bland, of Urmston, presided.

Messrs. J. Arthur Jones, Wrexham; J. T. Lord, Bolton; E. J. Elcock, Sheffield; and W. V. Macdonald, Frimley, Surrey, were elected members of the Union.

The HON. SECRETARY (Mr. Spears) said that one of the Bills dealing with the superannuation of public officers would come before Parliament on May 9th, and as far as possible members were requested to place themselves in communication with the local members of Parliament with the view of securing their vote for the measure.

On the motion of Mr. WORRALL, seconded by Mr. EVANS, it was decided to petition Parliament in favour of the Public Officers' Superannuation Bill.

In answer to a question, the CHAIRMAN said the Council of the Union had instructions to take action with regard to the other Superannuation Bill which was also before Parliament.

The motion was carried.

The quarterly meeting of the Midland Centre of the Union was held subsequently, Mr. W. H. Coney, of Wednesbury, presiding.

It was decided to hold the next meeting at Tamworth.

Mr. F. T. POULSON, of Stafford, read a paper, in the course of which he said he had been asked to say something about the projected union of the National Association with that of the Incorporated Association, and with the further view of the inclusion of all other outstanding associations and members so as to form all Sanitary Inspectors into one united body. The time appeared ripe for this, and he thought that as the first steps had been taken, the union of the two first-named associations would probably soon be accomplished. At a meeting of representatives of the two associations at Liverpool, on April 13th, the following points were raised as a basis of general agreement before the union could take place:—(1) That all unattached members of the associations should be allocated to district branches; and (2) that branches should elect their own representatives on the Executive. When they were branches of the Incorporated Association the difficulty was in obtaining adequate consideration of the work and position of the provincial inspectorate, the chief factor being the overwhelming voting power of the metropolitan members. This preponderating influence made itself very obnoxious at times, and actions were taken, of which the provincial inspectorate generally did not approve. However, many of the old difficulties had been removed, and whilst they were ready and willing to continue on a satisfactory and equitable basis they recollected that they belonged to an Association which had proved that the ideas and reforms they asked for were workable, for they had worked on the lines laid down, and found that their Association had never looked back. However, while there were many advantages in unity, they were not going to sell their birthright for a mess of pottage.

One of the principal advantages of the union would undoubtedly be the taking of the necessary steps to

obtain the settlement of the question of superannuation. There was no doubt that they ought to be in the same position as poor-law officials. There was one feature of all appointments, such as those of Sanitary Inspectors, which should particularly weigh with the powers that be, and that was the mutability of the *personnel* of the appointing Councils. It was easy to imagine an officer devoting his best days to the service of an Authority and giving every satisfaction, yet in course of time, and owing to changes which succeeding elections produced, a Council was elected who "knew not Joseph," and who might think a younger man preferable. The appointment might be advertised, and the officer might not get elected, and consequently be placed in an awkward and humiliating position. This was a strong plea for security of tenure as well as for superannuation. The dressing up of Inspectors in uniform, which might be a cross between that of a railway porter and the advertising uniform of well-known soap or tea firms, was not calculated to enhance their self-respect. It was said to be necessary to keep the officers in order, and so that they might be easily noticed and spoken to in connection with sanitation, but it also caused much extra trouble and annoyance to the public. A uniform acted badly when places of business had to be visited in connection with infectious diseases, calling public attention to the fact, and possibly injuring the tradesman. He was inclined to think that men should have the confidence of their superior officers and be trusted, and they would be more likely to live up to that trust, and when they felt that they were recognised as effective units in the sanitary army they were at once put on a higher mental and social plane to that which they stood as mere uniformed numerals. There was as much need for a revision of the methods of training men for warfare in the sanitary army as had been proved to be the case in the fighting army in the South African campaign, and the Inspectors as the rank and file must keep themselves ready to act at any moment, in whatever capacity or duty they might be called upon in the face of some attacking force, as plague or epidemic, carrying out the ideas of the Medical Officers and the instructions of the Authorities fearlessly and well, so that they might feel that they had tried to do their duty.

The CHAIRMAN said the paper was an interesting one. There was no question on which they were more in favour of than that of amalgamation, and he hoped they would be banded together in one strong body, and thus enabled to obtain that to which they considered they were entitled—fixity of tenure and superannuation. He moved a vote of thanks to Mr. Poulson for his paper.

Mr. BLAND seconded the motion; and Mr. LOWRY and Mr. SPEARS continued the discussion in regard to the proposed amalgamation and superannuation.

The motion was carried, and Mr. POULSON briefly replied.

This was the whole of the business. The members afterwards had tea at the Dolphin Hotel.

SOUTH WALES AND MONMOUTHSHIRE.

THE first meeting of the session was held at Abersychan, Mon., on April 27th. There was an excellent attendance of members.

The Council met at 12.30 p.m. under the presidency of Mr. John T. Owen, Chief Inspector, Merthyr, vice-chairman of the Council.

The secretary read the correspondence between himself and Mr. John Terry, Bury, Lancs, in the matter of Unity, and after a careful discussion Mr. J. Preece James, Tenby, chairman of the Council, and Mr. J. Towy Thomas, hon. secretary, were elected as representatives to attend conferences to further this aim. In case of their failure to attend Messrs. J. T. Owen and Jas. P. Jones, Gelligaer, vice-chairman, to take their place.

At 1.30 p.m. the members and visitors sat to an admirably served luncheon at the White Hart Hotel, generously provided by the members of the Abersychan Urban District Council. Mr. W. B. Mitchell, J.P., presided, and was supported by Mr. A. A. Williams, J.P., Panteg; Dr. Herbert Jones, M.O.H., Hereford (late Rhondda); Dr. Mulligan, M.O.H., Abersychan; Councillors J. Daniel Jones, W. Barrett, A. H. Bailey, Jno. Morgan, members of the Abersychan Urban District Council; Mr. W. Lloyd Marks, hon. treasurer; Mr. J. Towy Thomas, hon. secretary; and representatives from Newport, Cardiff, Rhondda, Blaenavon, Rhymney, Panteg, Llantarnam, Pontypridd, Pontypool, Caerphilly, Gelligaer, Aberdare, &c. &c.

Mr. W. R. JAMES, Chief Sanitary Inspector, Abersychan, read an admirable paper on "Needed Reforms in Sanitary Administration from an Inspector's Point of View," for which he was enthusiastically thanked. Discussion upon the same was deferred until the next meeting.

The SECRETARY reported upon the action taken in reference to the Superannuation and Tenure of Office Bill, and that encouraging letters had been received from Col. Morgan, M.P., South Monmouth; Mr. R. McKenna, M.P., North Monmouth; Mr. J. Lloyd Morgan, M.P., West Carmarthen; Mr. S. T. Evans, M.P., Mid Glamorgan, promising to give the Bill their best attention.

The secretary was thanked for the immediate action he had taken in the matter.

The usual vote of thanks terminated a unique meeting in the annals of the Association.

The arrangements by Mr. W. R. James were perfect, and the people of Abersychan may well be proud of their able and deservedly popular Sanitary Inspector.

Public Works.

SEWERAGE.

THE Local Government Board has sanctioned the borrowing by the Brighton Town Council of £8400 for works of sewerage.

THE Newhaven Urban District Council intends to apply for a 5 per cent. increase to the sewerage loan of £884 in respect of contingencies.

A SCHEME for dealing with the whole of the sewage of the town and county asylum of Sleaford has been discussed by the District Council, but no action was ordered.

THE Local Government Board has given formal permission to the Bideford District Council to borrow £2500 for carrying out the East-the-Water drainage scheme.

SANCTION has been received to the borrowing of £13,000 for purposes of sewerage and sewage disposal at Pembury, Tonbridge. The question of a water supply for Brenchley is under consideration.

THE Local Government Board has sanctioned a loan of £3900 for the Ongar sewerage scheme. The Board apportioned the cost on the basis of population; High Ongar would contribute £1029, and Chipping Ongar £2571.

THE Bill, confirming a Provisional Order made by the Local Government Board, empowering the Urban Sanitary Authority of the Borough of Leicester to compulsorily acquire land for the disposal of sewage, passed the Chairman of Ways and Means last week, and was sent for third reading in the House of Commons.

A Local Government Board inquiry has been held by Colonel J. T. Marsh, R.E., at Sherrington, as to the application for a loan for works of main sewerage and sewage disposal, per plans by Messrs. D. Balfour and Son. of London and Newcastle. The scheme comprises the laying of 3½ miles of main sewers, with manholes and flushing arrangements, also the construction of bacteria tanks and the laying out of the land, the effluent from which will discharge into the river Ouse.

Col. J. T. Marsh, R.E., on behalf of the Local Government Board, held an inquiry at Hallaton last week as to the application by the Rural District Council to borrow £2000 for the purposes of sewerage and sewage disposal. It is proposed to acquire six acres of land for irrigation purposes. There was some opposition to the scheme from a minority of those present on the ground of expense, a less costly scheme being advocated. Evidence having been taken, the Inspector was shown over the ground.

Extraordinary difficulties are still being experienced in connection with Fulshaw sewerage works, Wilmslow. Further steps have just been taken to protect houses in one district, where a sewer has been laid at a great depth. The sewer here has been open for months, and has caused considerable trouble. House property has had to come down, and a heavy claim sent in to the Council. It is feared that other claims will be heard of. The scheme is likely to be a most expensive one, and is causing great uneasiness.

The plans and estimates prepared by Mr. S. I. Adams for the extension of the Chadwell St. Mary and Little Thurrock sewer have been again considered by the Ossett District Council. The Clerk said Chadwell Parish Council did not want the work carried out; they thought it was unfair to the ratepayers. The letter was referred back to the Committee to report upon. The plans and estimates prepared by Mr. R. T. Stewart for the extension of the Little Thurrock sewer to the northern portion of the parish were adopted; and it was resolved to apply to the Local Government Board for sanction to borrow £2750 to carry out the work.

A quarterly meeting of the Lincoln Town Council was held last Monday. Formal sanction from the Local Government Board having been received to the proposed loan of £50,000 for the purposes of sewerage and sewage disposal, the Health Committee recommends that the Finance Committee be asked to take steps to obtain the said loan. It also recommends that Mr. Everard be empowered to proceed with his scheme as modified, including the preparation of quantities, and inviting tenders for the work in such manner as he shall think fit. The Finance Committee has resolved that the Council request the Town Clerk to communicate with the Public Works Loan Commissioners and with three or four mortgage brokers inviting tenders as to the terms upon which the sum of £50,000 can be borrowed for a term of thirty years.

At a meeting of the Skipton Urban District Council, last week, a communication was read from the West Riding Rivers Board complaining of the discharge of insufficiently-purified sewage into the river Aire from the Council's sewage farm, and pressing for effective measures to be adopted forthwith. The Board, further, gave the Council notice that if by the 1st of July next they were unable to show that some steps had been taken in the matter the Rivers Board would have to exercise their further powers. The Chairman (Mr. J. B. Dewshurst) said that to tell them (the Council) that they had done so little was more than the Rivers Board had any right to say. The Skipton Council was the first to do anything in the nature of sewage purification worthy of the name so far as the vicinity of the Aire was concerned. The letter was referred to the Farm Committee.

Mr. W. O. E. Meade-King, M.I.C.E., one of the Local Government Board Inspectors, held an inquiry last week at Colchester regarding an application by the Town Council for sanction to borrow £19,000 for sewerage works and sewage disposal.

The Market Drayton Rural District Council has accepted Mr. T. Healey's tender of £1065 for the construction of the filter for the Little Drayton sewerage scheme. This brings the total cost of the scheme up to about £3600, and the Clerk stated that it would be necessary to apply for power to borrow £710 in addition to the amount sanctioned by the Local Government Board.

The Local Government Board has written the Grays Urban District Council stating that, after considering the report of its Inspector on the application for sanction to borrow £1500 for sewage disposal works, it did not think sufficient reason had been shown for abandoning the scheme of chemical precipitation and artificial filtration, and therefore it could not sanction the proposed loan. The Surveyor said the fact was the Local Government Board would not let them save £100 a year, but wanted to make them expend more money.

The Town Clerk of Bridlington has received notification of the consent of the Local Government Board to borrow £5960 for the purposes of main drainage. The scheme of drainage has been prepared by Mr. E. R. Matthews, C.E., and has been passed without amendment by the department. The work will be proceeded with at the close of the season. It was anticipated that some difficulty would arise owing to the railway company objecting to allow the drain to pass under the railway crossing unless £10 were paid to the company, but apparently the fears of several of the Councillors have proved to have been groundless.

Major-General H. D. Crozier held a Local Government Board inquiry at the Town Hall, Wolverhampton, recently into the application of the Wolverhampton Corporation for a renewal of the certificate granted in May, 1899, sanctioning the means used by the Corporation for rendering harmless the effluent from their sewage works and land flowing into Pendeford Brook and its tributaries. At the conclusion of the inquiry the Commissioner said the fact that nobody opposed the application was most satisfactory. He congratulated the Sewerage Committee on the success which had attended its efforts.

Mr. James Murray, C.E., Master of Works, and County Sanitary Inspector for Paisley, in the course of his tenth annual report for the Second or Lower District of the county, deals at some length with the water supply and drainage. The reservoir on the Brueacre Burn, Inverkip, capable of impounding about two million gallons, will he expects be entirely finished by the month of May. The high-level filters and clean water tank at Kilmalcolm have now been completed at a cost of about £2500. Bishopton drainage scheme has been completed at a cost of £1800. The features of importance in connection with the scheme are that the sewage is purified by bacterial treatment, the sewers are ventilated not by street gratings but by ventilating shafts at the end of the sewers, and at the extreme end of the village a flushing tank has been provided. At Kilmalcolm the Committee is negotiating for ground for the purification works, estimated to cost £4500. Mr. Copland, C.E., reported on the drainage of Lochwinnoch, estimating the cost of drainage and purification works at £3000, which would be equal to an assessment of 9d. per £. Owing to some little difference arising with the proprietor of the ground in which the purification works are to be constructed, the Committee deemed it expedient not to go further meantime. This is to be much regretted, as it will retard the progress of the work.

WATER.

The Water Bill promoted by the Kettering Urban District Council to secure an additional water supply for the town was before a Committee of the House of Commons last week.

The balance sheet presented to the special meeting of the Bolton Corporation Waterworks Committee showed a profit on the year's working of £14,543 6s. 4d., £14,000 of which it was decided should be transferred to the borough fund for the relief of the rates.

The Ripon Rural District Council has decided to support the action of the West Riding Rivers Board in their application to Parliament for power to look after the compensation water gauges of the Leeds, Harrogate, and Ripon Corporations in the water schemes they are now undertaking, the chairman being deputed to give evidence before the Parliamentary Committee.

The Local Government Bill for confirming the Buxton Urban Council Provisional Order, which seeks to empower the Buxton Council to increase its borrowing power for the purpose of the water undertaking by £15,000—making the total borrowing power £45,000—last week came before Mr. J. W. Lowther's Committee as an unopposed measure. Formal evidence in proof of the preamble was given, after which the Bill was ordered to be reported for third reading to the House of Commons.

Considerable complaint has recently been made concerning the water supply to the Ben Rhydding portion of the Ilkley urban district, and at the meeting of the Ilkley Urban District Council last week it was reported that samples of the water had been submitted to the examination of analysts, who had pronounced the water free from sewage or other objectionable contamination, and, in their opinion, suitable in every respect for drinking purposes. These reports were considered highly satisfactory.

The Louth Waterworks Company has, we understand, lost its opportunity. The Corporation was anxious to imitate the example of the Spalding Urban Council, and to acquire the right of water supply for the town. It offered the Waterworks Company £14,000 for their undertaking, but this was declined. A largely attended town meeting has unanimously determined that no further steps should be taken. The Waterworks Company will therefore have to continue its existence and its work, and also its risks, for property of this kind in a declining borough is not likely to increase in value.

Since the defeat in the Committee-room of the House of Commons of the Derwent Valley Water Board efforts have been and are being made, says the Leicester correspondent of a Sheffield paper, to overcome the difficulty with reference to obtaining stone. The delay necessitated by the throwing out of part of the Bill has led to some bitterness of feeling in view of the urgency with which water was required in ample quantity by Leicester, and the members representing that town have had thrown upon them a heavy responsibility, inasmuch as with dry summers, pending the construction of the works, Leicester will be in great danger of another water famine. It is stated that these very grave responsibilities will probably have a determining influence over the course to be finally adopted. Leicester cannot afford, in view of their very heavy financial responsibility, under the Derwent Valley plan, to enter upon another scheme of water supply. The enforcement of these considerations has had much to do with the course which is now being pursued, of making a thorough and systematic investigation of the whole of the district, with the view of ascertaining what other stone is available of a suitable character for the work required, and it is expected that in a short time a report of the result of the inquiries will be laid before the Board.

At the annual meeting of the Howden Rural District Council a discussion ensued in regard to the water supply question in Howdenshire. The chairman then informed the Council that he had seen Mr. Bickersteth, clerk to the East Riding County Council, which body had passed a resolution empowering the Sanitary Committee to employ an expert to the amount of £200 to deal with the best way of supplying the Howdenshire district with water. No further action was taken in the matter.

There has been a complete failure to agree on the part of the Urban District Council of New Mills and the Rural District Council of Hayfield, with the promoters of the Stockport Corporation Water Bill, which seeks to impound all the waters of Kinder, from which district both the Derbyshire Authorities have water schemes prepared. At the recent conference in London of all the parties concerned the promoters of the Bill insisted on a price per thousand gallons which the Derbyshire Authorities considered very excessive, and as a consequence the opposition will be proceeded with before the House of Commons Committee.

The water question must be immediately faced in Ross. Owing to the pressure brought upon them by the Urban Council, most of the landlords are now fitting up their tenants' houses with water-closets. The Town Clerk informed a recent meeting that he had received a number of applications for water for flushing purposes, and that the meeting should seriously consider whether they were in a position to grant the application. He said that if they made many connections for flushing purposes there would be a very serious depletion in the summer months for drinking purposes. He said that nothing could operate more strongly in favour of providing a water supply than the giving of much water for sanitary uses.

At a special meeting of the Wellington Urban Council held recently, the agreement respecting the proposed transfer of the Council's right to supply Hadley and Ketley with water to the East Shropshire Water Company was considered. The Council was given to understand that in drawing up the agreement the present consumers at Ketley (customers of the Council) had had their interests safeguarded, and the company would not have the power to charge them at a higher rate than the Council did at present. With regard to Hadley, which is not supplied at present, the Council considered it was not justified in undertaking a scheme to convey water to that neighbourhood on account of the cost, and the refusal of the large companies there to negotiate as to the terms on which water should be supplied them from the mains until they were actually laid. The East Shropshire Water Company, it was furthermore believed, could supply these localities more expeditiously than the County Council by the scheme they have under consideration. Ultimately the Council's seal was affixed to the agreement.

LIGHTING.

In the House of Lords the Honley Urban District Council Gas Bill has been read a second time.

The Local Government Board has sanctioned the borrowing by the Brighton Town Council of £6400 for fifteen years for electric lighting.

At a recent meeting of the Wigan Town Council the chairman of the Gas Committee stated that the net profit of the gas undertaking for the past year amounted to £11,000.

The Limerick Town Council has received sanction to the borrowing of £22,000 for the purpose of carrying out the scheme for providing electric light for Limerick. The loan will be issued in four instalments, and is repayable in twenty-five years.

At a meeting of Dumfries Town Council last week, there was submitted a favourable report by Mr. Ritchie, Edinburgh, on a proposal to establish a station for generating electricity by water power on the Cargen Burn, about two and a-half miles above the town. Consideration was deferred.

Petitions on behalf of the following in favour of the Derbyshire and Nottinghamshire Electric Power Bill have been deposited in the Private Bill Office of the House of Commons:—(1) Digby Colliery Company, (2) Warsop Urban District Council, (3) Blackwell Rural District Council, and (4) Skegby Rural District Council.

The Alfreton Gas Bill, which has already passed through the House of Lords, came last week before the Examiners of the House of Commons for proof of compliance with the further Standing Orders. There was no opposition at this stage, and the necessary formal proofs having been given, the Examiners decided that the further Orders had been duly complied with. The Bill will accordingly, in the usual course, be reported for second reading.

The Colwyn Bay and Colwyn Urban District Gas Bill, which has already passed through the House of Commons, came last week before the Examiners of the House of Lords for proof of compliance with further Standing Orders. There was no opposition at this stage, and the necessary formal proofs having been given, the Examiners decided that the further Orders had been duly complied with. The Bill will accordingly, in the usual course, be reported for second reading.

Tollington Park has developed a desire for electric light, and the statutory number of private consumers have banded themselves together and planted a requisition for the supply of the electric energy ground out at Eden-grove by the Lighting Committee of the Borough Council. The mains will cost £3500 to lay down. But the Council has no option but to comply with the requisition. New Court Chapel is going to be switched on, and it is also said that St. Mark's Church will adopt electric light, as well as a number of the well-to-do private residents.

The Otley Gas Bill, the main purpose of which is to convert the Otley Gas Company from a limited into a Parliamentary concern, having been submitted to the Local Government Board, was approved by that department conditionally on a few alterations being made. These did not affect the purpose of the measure, and were acceded to by the promoters, who recently appeared before the Chairman of Committees of the House of Lords (Earl Morley) to ask that the Bill might be advanced. Messrs. Sherwood and Co., Parliamentary agents, appeared for the promoters, and called Mr. F. T. Hunter, solicitor, of Bradford, to show that locally statutory requirements, &c., has been attended to. His Lordship ordered the Bill to be reported, with amendments, for third reading.

The new Swindon Gas Bill came before Lord Morley in Parliament as an unopposed measure last week. Its object is to confer further powers on the New Swindon Gas Company, to enable it to consolidate the existing ordinary capital and convert it into new stock with a uniform dividend of 5 per cent. Owing to the rapidly increasing demand for gas in the company's limits of supply, power is also taken to raise additional capital, which shall be sufficient to produce, including the premiums, £60,000. This new stock is to be offered by auction or tender before being sold to existing shareholders. Power to borrow on mortgage to the extent of £15,000 is also taken under the Bill. The directors are also empowered to declare interim dividends. Mr. W. H. Ludgate, chairman of the company, proved the preamble, and the Bill was ordered to be reported to the House for third reading.

The Enfield Gas Company are inviting, by advertisement, tenders for a new issue of £5000 Consolidated Stock, particulars of which may be obtained at their offices. In view of the great and growing increase of the company's business, and the very successful operations of last year in particular, notwithstanding the great rise in coal, this proposal will doubtless attract the notice of investors.

Last week the Select Committee of the House of Commons, of which Colonel Welby is chairman, further considered the Bill under which power is sought to incorporate a company to supply Mond gas to an area of about 135 miles in South Staffordshire. The case for the promoters having been concluded, evidence was called on behalf of the Birmingham Corporation, in regard to a portion of whose district of gas supply the new company seek powers. Mr. Orford Smith, Town Clerk of Birmingham, said the Corporation viewed the proposal of the Bill as being essentially an experiment, and, having purchased the statutory right to supply coal gas, thought it very hard that this competing scheme should be established until it had been proved Mond gas could be distributed satisfactorily and was suitable for manufacturing purposes. Mr. Corbet Woodall, a gas engineer of wide experience, said he did not think the advantages of the scheme were such to justify its application in a large area. For an undertaking which was admittedly experimental the scale was greater than was necessary; the object was to establish directly or indirectly a monopoly. The capital expenditure proposed would be too small, especially as regarded the distribution plant. Mains worth £650,000 rather than £361,000 suggested would be needed; and although the promoters made no provision for storage, he held that large gasholders would be necessary. Further, these should be regulated as to pressure, constant supply, and composition of the gas. The Committee adjourned.

GENERAL.

The Swansea Town Council has resolved to spend £425 in providing sanitary conveniences on the sands and at Treboeth.

The London County Council has agreed to lend the Battersea Borough Council £3230 for the provision of a disinfecting station.

Dr. Wheaton, Local Government Inspector, held an inquiry at Repton into the proposal of Repton District Council to borrow £6000 for isolation hospital.

An inquiry has been held into the application of the Clacton Urban District Council to borrow £21,000 for the laying out of the East Cliffs, and the construction of a shelter, hall, and other conveniences.

At a recent meeting of the Ilford Urban District Council a letter was read from the Local Government Board enclosing its formal sanction to the Council's application to borrow £9445 for alterations to the isolation hospital.

The Local Government Board has issued a circular of measures to be taken to prevent the introduction of plague. On the arrival of a vessel on which there has been any plague all rats on board should be destroyed. Rats, when destroyed on shipboard, should not be handled, but at once cremated.

At a committee meeting of the Coal Smoke Abatement Society, held at 14, Buckingham Gate on Wednesday, May 1st, 83 smoke nuisances were reported by the society's Inspector. Instructions were given that the reports should be forwarded to the Borough Councils of Hammersmith, Chiswick, Fulham, Barnes, Kensington, Acton, Shoreditch, Holborn, Willesden, Brentford, Port of London, Battersea, City of Westminster, in whose districts the nuisances occurred.

The Health Committee of the York City Council has rejected a scheme to supply sterilised milk and feeding bottles similar to that in vogue in St. Helens.

The Merchant Taylors' Company have voted 100 guineas in aid of the re-building fund of the Royal Hospital for Children and Women, Waterloo Bridge-road, in memory of Queen Victoria, and the Clothworkers' Company £100 for its maintenance.

With the close of the first half of 1901 the London County Council will be in a position to give notice to the South London Tramways Company of intention to purchase the 4¾ miles of lines in York-road, North-street, St. John's-hill, Lavender-hill, Wandsworth-road, Falcon-road, Queen's-road, and Victoria-road.

Major Tulloch held an inquiry at Darlaston recently on behalf of the Local Government Board with reference to applications by the District Council for permission to borrow £1400 for the extension of pleasure grounds, £335 for a steam fire-engine, and £200 for electrically equipping and wiring the Town Hall buildings.

The small-pox epidemic, which was revived in Dundee by the Maxwelltown outbreak, is spreading with alarming rapidity in that district, and last week three new cases were admitted to the hospital. The first patient—a woman 20 years of age—was removed from a dwelling in James-street, immediately over the house in which the woman from Govan lodged, and in which the outbreak originated. In connection with this case seven contacts have been removed to the reception-house. There are now nine persons in the hospital, and twenty contacts in the reception-house.

Notices have been issued by the Eccles Corporation to the owners of property and tenants of the houses on the alleged insanitary area of Eccles, bounded by Church-street, James-street, and Barton-lane, that it is the intention of the Council to present to the Local Government Board a petition, in pursuance of the Housing of the Working Classes Act, 1890, praying that an order may be made confirming an improvement scheme, whereby it is proposed to take compulsorily the lands described in the schedule attached to the scheme. A map of the area has been prepared by Mr. Picton, the Borough Engineer.

At the first meeting of the newly-constituted Darlington Rural District Council, a letter was read from the Local Government Board complaining that it had not received the Medical Officer's report, and intimating that the grant-in-aid would be forfeited if the report were withheld. The Clerk reported that he had received the report from the officer, but without any explanation. It was reported by the Surveyor that there had been a case of typhoid fever in the district. It was remarked that the Surveyor was in this matter supplying the place of the Medical Officer. A resolution was passed, on the motion of Mr. Elwon, seconded by Miss Scurfield, that the Medical Officer be asked to resign.

Three weeks ago the Local Government Board gave notice to the Dunfermline Town Council that if steps were not taken within a fortnight to have the colliery houses belonging to the burgh put into a sanitary condition, proceedings would be adopted under the Public Health Act. At a special meeting of the Council in committee last week, terms were adopted which had been agreed to by the West of Fife Coal Company, the lessees of the houses, under which the town will put in thorough repair and provide washing-houses, drainage, and sanitary conveniences for the whole of the houses included in the lease, with the exception of twenty-three houses which have been condemned, and the company will, during the remainder of the lease, pay to the town interest at the rate of 6 per cent. on the capital outlay, and be relieved of the proportion of rent for the twenty-three houses.

The Liverpool City Council has decided to entertain the Association of Cleansing Superintendents of Great Britain when they visit the city next month.

A Local Government Board inquiry has been held at Whitley into three applications by the Whitley and Monkseaton Urban District Council for sanction to borrow £1945 for improvements, £1587 for works of public street improvements and the formation of a new road, and £800 for the erection of public conveniences on the Whitley links.

A return has been issued showing, with reference to the cases of lead poisoning reported during the years 1899 and 1900, in the earthenware and china industry:—(*a*) The severity of the attack; (*b*) the number (if any) of previous attacks; and (*c*) the main symptoms referable to lead poisoning. There were eight fatal cases last year, as compared with sixteen in 1899.

The new baths which are being erected in Sommerton-road, Govan, are rapidly approaching completion, and one at least may be opened in the course of next month. Work on the baths was begun in August, 1899, and the whole will be finished well within contract time. There are two swimming baths, each 75ft. by 35ft., one 7ft. 6in. to 3ft. 6in. in depth, and the other 3ft. 6in. to 2ft. 6in. The smaller of the two will be open first. The deeper has a gallery providing accommodation for 400 to 500 spectators. The baths are provided with every approved appliance for heating and circulating the water, and there are besides a number of slipper baths for ladies and gentlemen. The entire buildings cover an area of 3940 yards, and the cost will be £25,000.

A Local Government Board inquiry has been held at Northwich relative to the decision of the four Mid-Cheshire Local Authorities to object to an order of the County Council constituting the Northwich, Winsford, and Middlewich urban districts into a united district for the provision and maintenance of an infectious diseases hospital. Mr. Algernon Fletcher opened the case for the Rural Council. He said their main objection to combination was that the Authority had been, was still, and would continue to be, desirous of making due provision for the wants of its own district. He contended that the Act was never intended to force combination upon an unwilling people. He urged that combination was impossible, inasmuch as there was no permanency in erections in the Northwich and Winsford areas. Mr. Colt Williams, for the County Council, argued that the County Council had been in no way coercive, and had given each Authority ample time to make proper provision. Taking each of the existing hospitals, the accommodation was altogether inadequate. Expert evidence was then given.

At its meeting on Tuesday the London County Council arranged for another issue of £2,000,000 London County Stock. It is interesting, says the *Westminster Gazette*, to note that the fixed-price principle which was adopted as an experiment at the time of the last issue, and proved so successful, is to be again put into force. In June last year the County Council offered £5,000,000 in three per cents. at 97½, and it may be remembered that there was such a rush for prospectuses that the supply at the Bank of England momentarily failed. The amount was applied for some five times over, and the quotation immediately rose to 1⅜ premium. The price at which the new issue will be made is awaited with lively expectation, the quotation for the existing issue being 99½, before the new issue was expected, although it has fallen to-day. That the applications will be large, despite the issue of Consols, on which the first instalment falls due at the end of next week, is almost certain, as the security is for all practical purposes as sound as Consols, and the yield even at par, is much better.

PERSONAL.

Dr. Boyd, of Southampton, has been appointed Medical Officer of Health for South Shields.

Mr. J. S. Hendey, of West Bromwich, has been appointed Borough Surveyor for Cannock Chase.

Mr. H. W. Smith has been appointed Resident Engineer for Leigh, at a salary of three guineas per week.

Mr. T. Latham, of St. Leonards-on-Sea, has been appointed Inspector of Weights and Measures for East Riding.

Mr. W. Parsons, of Leamington Spa, has been appointed Sanitary Inspector for Stroud, at a salary of £120 per annum.

The Local Government Board has sanctioned the appointment of Dr. James Eaton as Medical Officer of Health for Grantham.

Dr. C. Matthews has been appointed Medical Officer for the Atherington district of Barnstaple, in room of Dr. Anderson, resigned.

The Local Government Board has sanctioned the permanent appointment of Dr. A. B. Vise, as Medical Officer for the Holbeach South District.

Mr. J. E. Fothergill, of Arnold, Notts, has been appointed Surveyor and Inspector of Nuisances for the urban district of Brentwood at a salary of £150 per annum.

Messrs. G. F. Clark, of Southampton, and G. J. Gregory, of Portsmouth, have been appointed Sanitary Inspectors of Holborn borough, at salaries of £130 per annum.

Mr. T. F. Strutt, who for sixteen years was senior and Chief Sanitary Inspector to the late Strand Board of Works, has been appointed Chief Sanitary Inspector for the City of Westminster.

The Southwark Borough Council has received a letter from the Local Government Board sanctioning the payment to Mr. G. Millson, as Medical Officer of Health, of a salary at the rate of £750 per annum from November 28th, 1900.

Dr. George Turner has been appointed by Sir Alfred Milner Medical Officer of Health for the Transvaal. Dr. Turner, who prior to the outbreak of the war filled a similar position in Cape Colony, has been provisionally acting as Medical Officer for the Transvaal, and his services have been recognised by Lord Roberts.

Mr. Burnage, who has served his articles with Mr. Molineux, Superintendent Surveyor to the Ulverston Rural Council, and has been acting recently as temporary Surveyor for Low Furness, for which post he was an applicant, has been appointed Assistant Surveyor to the Warrington Rural Council, being selected out of sixty-six applicants.

Darlaston. — The annual report of Dr. Sydney Partridge, Medical Officer of Health for Darlaston, has been issued, and records a birth-rate of 38·19, and a death-rate of 24·24 per 1000 of the population. There were 193 deaths of children under five, and although this was 17 fewer than in the previous year the percentage was 5·92 of the total, the excessive mortality having been attributed chiefly to injudicious feeding and insanitary conditions. There had been about 88 cases of neuritis due to the presence of arsenic in beer, men being more frequently attacked than women. There had been no deaths from the disease, and no fresh cases had occurred since 1st December.

NOTES AND QUERIES.

Subscribers may obtain advice on matters appertaining to Public Health Law and Municipal and Sanitary Engineering. Letters should be addressed "Notes and Queries," The Sanitary Record, 5, Fetter-lane, London, E.C. If an answer be required immediately, a stamped addressed envelope must be enclosed

2186.—Water Containing Chlorides: Filter for, Required.—"Inspector" writes:—"A well about a mile from the seacoast yields a water containing an excess of salt. Is there any reliable filter that will reduce the excess of chloride?"

Answer.—There is no ordinary household or domestic filter to our knowledge which can be depended on to reverse the sodium chloride in the water.

2187. — Private Street, Making Up: Procedure.—"Surveyor" writes:—"About two years ago A opened a new street in the town of B, first obtaining the approval of the Rural District Council in whose area B was at the time. Recently B has been formed into an urban district. A undertook, when submitting his plans, to form the new street and cover it with 9in. of ballast, and 3in. of metalling. This metalling has not, however, been carried out, and some of the houses are now ready for occupation. *Query.*—Can the Urban District Council of B now refuse to grant certificates of occupation to the house owners until A properly metals the road? If not, how can A be compelled to do the work? I may say that the Urban Council is prepared to take over the street as soon as it is properly done."

Answer.—The Council cannot withhold certificates of occupation of houses on the grounds stated. The Urban Council may enforce the making up of the street, under Sec. 150 of the Public Health Act, 1875, and we advise that when the road has many houses built upon it that this procedure be followed. The Council are not enabled to take over the road until it has been sewered, levelled, paved, metalled, and made good to their satisfaction.

2188.—Connecting Drains into adjacent Authority's Sewers: Rate of Contribution.—"Surveyor" writes:—"Could you oblige me with information as to the amount charged to owners outside a drainage district wishing to connect to another Authority's sewers under Sec. 22 of the Public Health Act, 1875? Or what do you consider a fair basis to work on?"

Answer.—What appears to be a very general and reasonable payment is an annual payment at the rate of 6d or 8d. in the £ on the rateable value of the premises to be drained.

2189.—Child in Filthy Condition: Power of Medical Officer of Health.—"M. O. H." writes:—"A child attends an elementary school in this district, and the mistress finds her head in a filthy condition from vermin. She sends her home, and the matter was laid before the School Attendance Committee, who refer it to the Rural District Council as Sanitary Authority. They request me as Medical Officer of Health to inquire into the matter and report on it. Is this any part of my duty as Medical Officer of Health, and if so what can I do, and under what Act of Parliament?"

Answer.—The Medical Officer of Health can visit the house where the child resides, and if, as is probable, it is in a filthy condition, he may issue a certificate under Sec. 120 of the Act of 1875, or if the Infectious Diseases Prevention Act, 1890, is in force in the district, under Sec. 5 of that Act for the cleansing and disinfecting of the house. He may advise the parents or guardians as to the necessity for keeping the child in a cleanly condition, but there is no statutory power to compel such cleansing of the child.

2190.—Fish Unfit for Food: Condemnation when not Offered for Sale.—"G. H. P." writes:—"A, a London wholesale dealer, sells to B, a country retailer, a case of fish guaranteed to be good. B, upon his arrival in the country, opens the case, and finds the contents unsound, and unfit for food. He thereupon places the same in his cart and takes it to the local Inspector of Nuisances, who at once condemns the fish as unfit for food. It will be noted that B had not deposited the fish in any place for sale, had not prepared it for sale, nor did he, upon seeing its condition, intend it for the food of man, and it would appear that by applying to the local Inspector he does so simply to protect himself from loss and any liability. Will you kindly say (1) Who was responsible under Sec. 116 of the Act of 1875, A or B? (2) Is the act of seizure under the same section compulsory or optional? (3) What would be the correct action of the Inspector in this case?"

Answer.—(1) The vendor A if he sold, as it would appear was the case, the fish for human consumption, was the person liable. Unless the Local Authority have adopted Part III. of the Public Health Acts Amendment Act, 1890 (see Section 28

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thereof) the Inspector was not obliged to act, as the fish was not intended, being in B's hands, for human food. (2) Seizure of diseased meat is optional, but an Inspector would probably deserve censure if he neglected to discharge his duty in such cases. (3) The action of the Inspector in seizing the meat was, subject to Answer 1, justifiable. It must be observed, however, that a justice must condemn the food. It is not the province of an Inspector.

2191. — Appointment of Sanitary Inspector: Is a Licensed Victualler Qualified?—"G. P." writes:—"I enclose cutting from newspaper relating to a Local Authority which had appointed a licensed victualler as Sanitary Inspector. The Local Government Board, however, informed the Authority that such a person could not hold the appointment. Will you please advise whether it is intended to mean that an Inspector must not keep a public house while holding office, or does it mean that he must not previous to appointment have been a licensed victualler? I wish to add that I find the 'Notes and Queries' column gives a great amount of useful information."

Answer.—The refusal of the Local Government Board to sanction the appointment of a licensed victualler to the office of Inspector of Nuisances in the case named may be taken to mean that no person who is a licensed victualler can carry on such a business and act at the same time as an Inspector of Nuisances. Any Local Authority who expects such a tradesman to be capable of discharging his duties impartially, and with a proper regard to the sanitary administration of the district, manifests an ignorance which is not creditable.

2192. — Factory Inspectorships' Examinations, &c. — "E. H. F." writes: "Will you kindly inform me if there is in existence any examination board which grants certificates for proficiency to act as Factory and Workshop Inspectors? Please also advise where all necessary information respecting the same and the appointment of Factory Inspectors may be obtained."

Answer.—The querist will find all information respecting the examinations and qualifications for Factory Inspectors in our replies to queries 994 and 1485 in our issues of March 18th, 1898, and May 26th, 1899, to which he should refer.

Death-rates in Urban Districts in 1900.—Dr. Cecil Moore, M.O.H., City of Hereford, writes:—"Referring to Query 2185 in your issue of the 2nd inst., your correspondent will find in the *British Medical Journal* for February 23rd, 1901, page 494, an article on "English Urban Mortality in 1900," which is specially reported, and will be found interesting."

Answer.—We are much obliged to Dr. Moore for the valued information. We may add that the mortality rates in thirty-two great provincial towns in the kingdom in 1900 was furnished in our reply to Query 2117 in our issue of March 14th. The birth-rate in these towns for 1900 was 29·9; death-rate, 20·0; and death-rate from the principal zymotic diseases, 2·69 per 1000 living.

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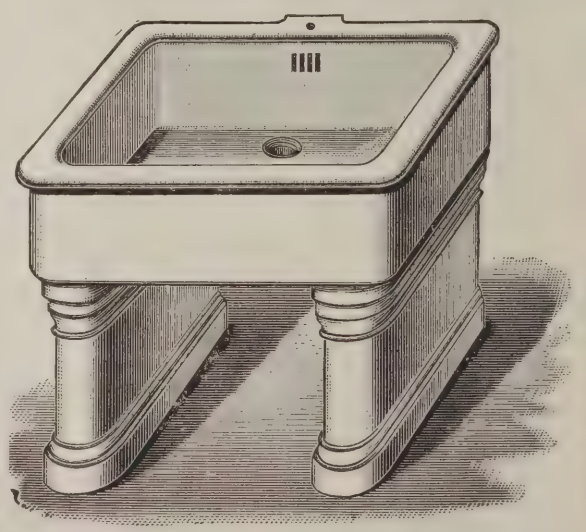

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PUBLIC LIGHTING BY GAS & ELECTRICITY

By W. J. Dibdin, F.I.C., F.C.S.,
Late Chemist and Superintending Gas Examiner to the Metropolitan Board of Works and the London County Council.

(*Continued from page* 264.)

CHAPTER XVIII.—DISTRIBUTION OF LIGHT.

The methods of distributing artificial light, whether for open spaces or for indoor illumination, must be very carefully considered. In too many instances a single powerful electric light or gas burner is placed in a position from whence its rays spread out in such a manner that the illumination obtained at the most distant point is considered sufficient for the purpose required. Such a system is, in principle, most wasteful, as in order to secure a sufficient degree of illumination of light at a few points, an enormous excess is wasted at the majority of the others, whilst the strain on the eyes of the individual whenever the direct rays from the powerful light source impinge upon them is most taxing.

The wonderful accommodating power of the diaphragm of the eye largely mitigates this evil, truly; but an evil it is, and one which is increasing. There can be no doubt whatever that the work of the professional oculist has been not a little enhanced by the ill-considered systems of artificial illumination so much in vogue during the past two or three generations. Many people now-a-days practically spend all their lives, especially during the winter months, working by artificial light. Every time the direct rays from a light source impinge directly upon the retina, the iris, or "pupil," of the eye instantly closes until the intensity of the rays passing through it is reduced to bearable limits. As soon as the direct rays cease to enter the eye, the pupil expands in order that sufficient light from the less illuminated object in view can act upon the optic nerve, as otherwise the object viewed would be invisible, or nearly so. This constant action of the pupil, or "guardian angel" of the eye as it might be termed, combined with that in the optic nerve, and the crystalline lens, becomes most fatiguing, and in time unquestionably affects the power of vision.

The dazzling effect, as it is commonly called, of intense light, is perhaps most noticeable in a street or country road on a dark night, when the ordinary gas flame has been replaced by an incandescent burner. As the observer approaches the light the illumination is clearly perceptible up to the point at which the lamp-post stands, but beyond that all is utter darkness, by reason of the contrast. If the observer's eyes are shielded from the direct rays, the illumination of the immediate background will at once be seen to be fairly good. It was this effect, enormously intensified, which made it necessary to enclose electric arc lamps in opal or ground glass globes. It is not necessary to dwell on the point further at present, but it is eminently desirable that it should be clearly indicated, with a view to ensuring its avoidance to the utmost extent possible.

The first object to be kept in mind when designing an installation is that the place to be illuminated should have as far as possible all parts equally brilliant, without undue shadowing in any part. For this reason powerful arc lights should be reserved for large interiors and open spaces. For small interiors the incandescent lights are at the present time most suitable. Many persons prefer the lights arranged round the room against the walls. It is, of course, largely a matter of taste; but, for the reasons above referred to, it is decidedly bad for the eyesight that the lighted source should be placed in a position from which the direct rays impinge upon the eyes. Apart from this by no means unimportant consideration, it is very much open to question whether it is always so effective as it is often claimed to be.

For instance, take the case of an ordinary sitting-room. In many instances pictures are hung upon the walls. What will be the effect on these when the light is held by a bracket on the wall about 12in. or 18in. in front or on one side of the picture? Again, if one decides to read comfortably, the reader's back should be turned towards the light. If this is on a small bracket the reader should sit facing, or near to, the middle of the room, a position not always desirable. The older method of having the lights in a sitting-room as near the ceiling as possible, and fairly distributed, is by far the best. If sufficient lighting power by this method cannot be obtained, then by all means use a small single light source as close as possible to the object to be illuminated. But this is not the general illumination which is the object under consideration.

The method of diffused top-lighting is well exemplified in the case of many of our public rooms, in which the incandescent lights are distributed all over the ceiling, with the result that they do not distress the eyesight of the observer, whilst a thoroughly uniform illumination is secured in all parts of the room.

The system adopted in certain halls, such as that arranged by Mr. Sugg at Reading, in which the lights are placed round the top of the walls behind glass screens, so that the direct rays are invisible, is excellent. Another instance of the same kind is that at the Houses of Parliament, in which the gas lights are placed over glass screens in the ceiling, with the result that a perfectly even illumination is maintained.

One objection raised to these methods is that the expense is greater than would be the case if the lights were visible. This raises a point of economy which, although desirable and necessary in many instances, does not, and should not, carry all before it. Where the comfort and convenience of large numbers of people are concerned for many hours at a time, undue economy in regard to effective illumination will often entail eventually such serious results in respect to eyesight that it often really becomes the worst form of extravagance.

The first point, therefore, which must be considered is, that the lighting arrangements must be thoroughly equal to the requirements of the case. This brings us to the consideration of the most desirable working power of light at the immediate point of observation.

Many years ago Mr. Sugg suggested that the standard of artificial illumination should be the degree of illumination afforded by one standard candle placed at one foot distance from the surface to be illuminated. Sir William Preece subsequently proposed at the Paris Electrical Congress in 1889, the "lux," by which term he indicated the illumination afforded by a Carcel lamp acting at a distance of one metre. As the Carcel lamp is equal to 9·5 English standard candles, and the metre is equal to 3·2809ft., and the illumination is inversely to the square of the distance, it follows that the quantity of light received upon a standard surface in the case of the lux would be practically the same as in the instance proposed by Mr. Sugg. Strictly, a candle-foot is 0·882 of a lux or Carcel-metre, and a lux is 1·133 candle-foot. We may, therefore, adopt the "candle-foot" degree of intensity as a useful guide. For the purpose of working out the required intensity of a series of lights for illuminating a given area, Mr. Sugg has compiled the table given on the next page.*

"*Illuminating effect* is the distance from the surface to be illuminated, at which the standard candle must be placed to give the same amount of light as that supplied by a given light at a given distance. This may be found by dividing the distance of the light by the square root of its intensity — see table. Thus a

* Abstracted from the "Gas Engineers' Pocket Almanac." W. Sugg and Co.

50-candle light at a distance of 15ft. would give an effect equal to that of one candle at a distance of 2·12ft., as $\frac{15}{7\cdot07} = 2\cdot12$.

"*Illuminating value* is the strength expressed in candles of the light which would be required at a foot distance to produce the effect of the given light at its given distance. This is found by dividing the intensity by the square of the distance." Thus it may be desired to ascertain the strength of the light which would be required at a foot distance from a given object to produce the effect of a sixteen candle lamp placed 6ft. from that object. The answer is $\frac{16}{6^2} = 0\cdot44$, which is the "candle-foot," or "illuminating value" of the light obtained under the conditions given.

Table of Square Roots for the Calculation of Illuminating Effect.

No.	Square root.	No.	Square root.
1	1·0000	17	4·1231
2	1·1442	18	4·2426
3	1·7320	19	4·3589
4	2·0000	20	4·4721
5	2·2360	25	5·0000
6	2·4492	30	5·4772
7	2·6457	35	5·9161
8	2·8284	40	6·3245
9	3·0000	45	6·7082
10	3·1623	50	7·0711
11	3·3166	100	10·0000
12	3·4641	200	14·1421
13	3·6055	300	17·3205
14	3·7416	400	20·0000
15	3·8730	500	22·3607
16	4·0000		

If it is required to ascertain the candle-power of a lamp which should be placed at a given distance from the object to be illuminated, in order that the degree of illumination shall be equal to that which would be afforded by one candle at a foot distance, any number in the above table may be read as *candle-power of the lamp required*, and its square-root as the *distance in feet at which the lamp is to be placed*. Thus, let it be required to illuminate an object to the extent of a "candle-foot" by means of a lamp which must be placed 9ft. distance: As $9^2 = 81$ = the illuminating power of the lamp required.

The origin of the expression "candle-foot" is related by Mr. Sugg to be as follows† :—"The only case in which he had been able to feel satisfied with lighting requirements was that of the Grand Committee-room of the House of Commons. A piece of paper was given to him with some pencil marks upon it, and his instructions were that a sufficient amount of light should be given to enable a man with ordinary eyes to read what was on the paper. He had only to get half a dozen men to read the paper, and see at what distance he held it from a standard candle. Then the problem was solved, the light required being one candle-foot."

In the opinion of Mr. Trotter the candle-foot is a very convenient and "comfortable" illumination. It is for most people the best illumination for reading, and is to be found on most well-lighted dining tables and billiard tables. More than 2 candle-feet is seldom attained in artificial illumination.

The importance of reflection in the distribution of light must not be overlooked, as by its judicious utilisation greatly enhanced results may be obtained, whilst in some cases the use of reflected light only has been found to give the most satisfactory results, where, for instance, operations of a delicate nature, such as fine wheelwork and other mechanician's work, have to be performed. Mr. G. Kapp has described‡ the following method of utilising only reflected rays in the case of a factory in Berlin, where great difficulty had been experienced in finding a suitable light. The ordinary arc lamp would not do because it cast too strong a shadow, and, in turning arbors and axles, and milling toothed wheels, a uniformly diffused light was required. Glow lamps, which might have fulfilled this condition, were too much exposed to breakages from chips flying about and carelessness of workmen. The solution which the manager of the shop found was to put arc-lights into big funnel-shaped covers, whitewashed inside, and to hang them up 8ft. from the floor. The ceilings were kept white-washed, and the effect of the lighting was excellent. The arc could not be seen, being entirely hidden by the funnels, but the room was filled with a very soft diffused light. Another similar instance is that quoted by Mr. G. F. Deacon, who referred to the public library in Liverpool, the Picton Reading-room, as one of the best illuminated rooms in the kingdom.

It was a circular room, 100ft. in diameter, with a domed ceiling. For the purpose of illuminating the tables and floors he put in the centre of the room three arc lights back to back. Under them he put an opal chalice 12ft. in diameter, resting on an ornamental vase. He then whitewashed the dome, and the effect was excellent. The absolute amount of light was nearly uniform over the whole surface of the tables.

The degree to which white surfaces reflect light is not generally so well understood as it should be. According to Mr. Trotter, good paper, plaster of Paris, and even whitewash, have a reflecting power equal to that of ordinary looking glass, viz., about 85 per cent.

It has been held that outdoor illumination commences to be useful only when it is comparable to moonlight.

The following determinations of the intensity of moonlight are on record, viz.:—

Authority.	Moonlight = 1 candle at feet distance.	
Plummer*	8·72	Average = 7·77
Dibdin†...	7·20	
Dibdin†...	6·33	
Dibdin†...	8·60	
Trotter,‡ average	8·00	

* "Monthly Notices," Roy. Ast. Soc., vol. xxxvi.
† "Proceedings," Roy. Soc., vol. li.
‡ Inst. C.E., see *ante*.

Taking this average of one candle at 7·77ft. distance, moonlight is therefore equal to 0·017, or, say, one-sixtieth of a foot-candle.

It will be understood that these determinations apply to full moon, but at different zenithal distances. The point in all its phases is a complex one, but the above general results will be sufficient for our present purposes.

The degree of illumination of certain public interiors may be gathered from the following tabulated results of observations by General Festing, Mr. A. P. Trotter, and others :—

Date.		Candle-foot.
—	President's desk, Inst. C.E.	0 8*
	South Kensington Museum :—	
1888	North-east Water Colour Gallery (gas)	1·81†
,,	South-east ,, ,, ,, ,,	2·32†
,,	Jones' Bequest Gallery (6 glow lamps)	1·72†
,,	Raphael Gallery (arc)	2·26†
,,	Sheepshanks Gallery (arc)	3·12†
1892	Sculpture Court (6 arcs in sight)	0·55*
,,	,, ,, (8 ,, ,,)	0·8*
,,	Silversmiths' Court (10 arcs in sight)	2·6*
,,	Japanese Court (8 arcs in sight)	1·6*
,,	Great Hall (9 arcs in sight)	2·4*
,,	Gallery over Silversmiths' Court	3·5*
,,	Corridor (glow lamps)	0·65*
,,	Charing Cross railway station, max. (arc)	0·4 to 0·5*
,,	,, ,, ,, min. (arc)	0·05*
,,	Cannon-street Station max. (arc)	0·4*
,,	,, ,, min. (arc)	0·025*

† Institution of Civil Engineers. Discussion on Mr. Trotter's paper, vol. cx., part iv.
‡ Institution of Civil Engineers, vol. cx., part iv., p. 72.

Date.		Candle-foot.
1892	... City of London, Cornhill	0·25*
,,	... ,, ,, ...	0·1 to 0·5†
,,	... Whitehall...	0·1 to 0·5*
—	... Great George-street, Westminster (5ft. gas lamps)...	0·9 to 0·005*
—	... Lyric Theatre (without arc or limelights)	3·8*
—	... Prince of Wales' Theatre	2·9*
	... Trains on Metropolitan and District railways (breast high)	0·3 to 0·9*
—	Lime-street, Liverpool (gas, flat flame)	0·25 to 0·53§

* Trotter. † General Festing. ‡ Preece. § Boulnois.

NUISANCES AND METHODS OF INSPECTION.[1]

By J. Spottiswoode Cameron, M.B., B.Sc., M.O.H. Leeds.

NUISANCES AND INSANITARY CONDITIONS.

(*Continued from page* 401.)

The water-closet, if inside the house, is often placed on the landing between the flights of stairs. The pan itself must, of course, be looked at, and the joint of the trap felt over with the finger. Any smell about the apartment should have been noticed on entering. The woodwork must be examined for fungi, the riser removed, and the space behind scrutinised for leakage or accumulations. The flushing rim of the pan should also receive attention. I have found it foul with excrementitious matters in a perfectly clean house where the basin itself was carefully attended to.

The efficiency of the flush will be examined, and before the inspection of the house is completed it will probably be convenient to put a smell test down the pan. If this is done carefully, it is possible to arrange it so that the smell shall not be generated until the substance used is past the trap. If there be any leakage of the joints of the pan, the smell of the test will be quickly discovered in the closet itself. If there be a

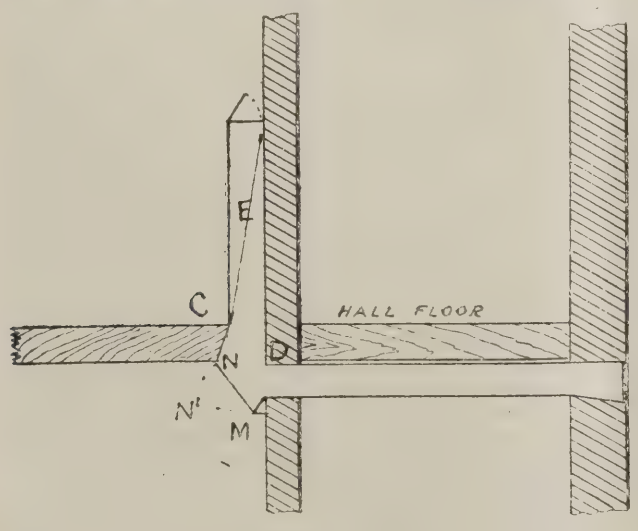

Fig. 9

leakage in the drains elsewhere in the dwelling, the smell may not be detected for perhaps as long a period as half an hour. It is convenient therefore to set the test going before completing the inspection. To the choice of strain tests I shall refer later.

The closet itself should, of course, be against the outer wall, should have a good large window—the ordinary water-closet window is ridiculously small—and this window should be made to open. There should also be some permanent means of ventilation, preferably at two points above and below, and if possible from different sides of the building. This can sometimes be obtained, as shown in the diagram, (Fig. 9), where the air is brought underneath the flooring of the passage. It is preferable, of course, to have a sort of ante-room leading to the closet, with its own window and its own ventilation. This is generally insisted upon in hospitals (Fig. 10).

I find a little difficulty in getting from our assistant inspectors the exact situation of the water-closet when it is inside the house. This, as you know, is fortunately an exception in cottage houses. The size of the soil-pipe is on the form already shown you, but I have found it desirable in the small number of cases where the closet is inside the house, to ask for further information in the form of answers to the following queries:—

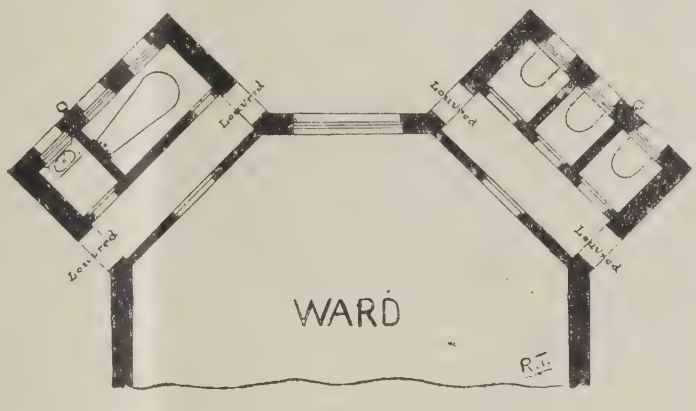

Fig. 10

Inside Water-closets.
(Special queries.)

The Inspector is required in filling in the information about houses containing inside water-closets to state in each case:

(*a*) Where the water-closet is situated:

(*b*) How the apartment is ventilated (size and position of ventilator):

(*c*) How it is lighted (size of window, nature of sash):—

(*d*) The relation of the door of the apartment to bedrooms, &c.:

(*e*) Whether the soil-pipe is entirely inside the house, or, if only partly, how much is inside:

(*f*) Where the joint between the basin and the soil-pipe is:

(*g*) What is the kind of basin:

(*h*) Whether there is a syphon flush:

(*i*) And to give any further information of a similar kind.

A

B

The pan of the water-closet should have as little wood-work around it as possible. A riser is a disadvantage. On the whole, probably the best kind of pan is the wash-down so shaped that the basin descends vertically behind, and that the water in the trap lies for a few inches in the basin. It is of the greatest importance in cottage houses that the whole contents of the closet cistern should be discharged without the necessity of holding back the valve. There are various syphon arrangements by which this can be effected. The extra cost to the owner is soon returned in the saving of stoppages.

The soil-pipe should go outside the house as quickly

[1] A lecture delivered in the Philosophical Hall, Leeds, April 13th, 1901. The illustrations to this lecture are from Dr. J. Spottiswoode Cameron's little work, entitled "Is my House Healthy?" published by Mr. R. Jackson, Leeds, and are reproduced in these columns by special permission

as possible, and should be continued its full bore above the roof of the house. It, of course, should not be used as a fall-pipe, as in the diagram (Fig. 12), still less should it open near a window (Fig. 13).

The disconnection of the bath and lavatory wastes should be, as shown in diagram (Fig. 5), managed in a similar way to that of the kitchen sink. It may be necessary to have a fall-pipe head, especially if roof water is to be carried down, as shown in the diagram

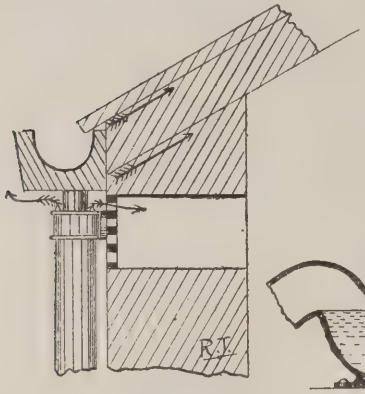

Fig. 12

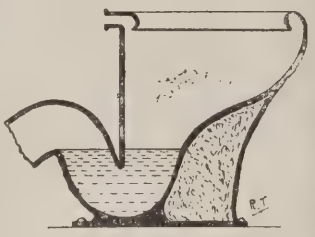

Fig. 11

A common fault consists in carrying a lead waste-pipe outside the house and into a larger iron fall-pipe reaching down to the ground. The fault consists in sealing the upper end of this iron portion of the waste, thereby making a dead end immediately outside the S trap. The larger pipe, fouled with suds, is never thoroughly ventilated. If the upper end is left open, protected if need be by wires, a current of air is sent down the pipe every time the basin is used.

Fig. 13

In glancing through the bedrooms it is well to look not only for evidence of damp, but to inquire, should the papers be of a particularly brilliant character, whether any of the family have suffered from sore eyes or symptoms of peripheral neuritis, and, if necessary, have a specimen of the wallpaper analysed for arsenic. The practice of putting the new over the top of the old paper is very unwholesome, and, if your visit is on account of illness, must be kept in mind.

(To be continued.)

ASSOCIATION OF CLEANSING SUPERINTENDENTS.

MEETING AT SHEFFIELD.

The quarterly meeting of the Association of Cleansing Superintendents of Great Britain was held in Sheffield, in which city the Association was inaugurated three years ago. Since that time it has made considerable progress, and is now a flourishing institution. The president is Mr. M'Taggart, of Bradford, and members attended representing Leeds, Leicester, Nottingham, Burton, Salford, Rochdale, Huddersfield, Buxton, Liverpool, Widnes, Withington, Stockport, Chesterfield, Burnley, Warrington, Ashton-under-Lyne, and other places.

Considerable interest was manifested by the visitors in a number of plans of the new destructor in course of erection at Penistone-road, which had been pinned up for their inspection in the Council Chamber. When all the company had arrived, the party, numbering 46 in all, left in conveyances for the Brightside baths. Councillor Chas. Hobson, Councillor Gent, and Councillor Nowill accompanied the visitors, whilst Mr. James Jackson, the Sheffield Cleansing Superintendent, acted as guide. The Brightside baths are the ones most recently erected by the Corporation, and are, consequently, quite up to date. Accompanied by Mr. George Hope, the manager, the visitors were shown round the fine swimming bath, which was generally admired, the slipper baths, and the basement where the washing is done and where the water is heated. The large cistern, it was explained, was capable, under forced pressure, of heating 3000 gallons of water per hour.

The conveyances next took the party to the Lumley-street destructor, this being the most interesting visit of the morning. Proceeding along the wide approach road, the party, conducted by Mr. Jackson and Mr. Arden (the engineer at the destructor), were first shown the tipping platform, which is 37½ft. wide, and runs the whole length of the building, 154ft. The cells were then inspected. The three large fans, each running at over 1000 revolutions per minute, were in motion, and these accelerating the pull of the chimney, a great draught of air was produced, and the burning powers of the cells appeared to be tremendous. The cells are sixteen in number, and are guaranteed by the builders, Messrs. Goddard, Massey, and Warner, Limited, of Nottingham, to burn ten tons of refuse each per twenty-four hours. This gives a total of 160 tons per day for the whole destructor, or something near a third of the total refuse of the city. The cells are 6ft. by 6ft. square, the arches all turned with headers throughout, and the fire-bars are of the straight fixed type. There is also a mattress chamber, which is so constructed as to enable mattresses to be deposited into the fire without undue handling. After the cells, the engine-room was visited. The horizontal single-cylinder condensing steam engine for driving the main shaft, &c., capable of exerting 70 brake horse-power when working non-condensing, and the single-acting double-cylinder high-speed engine used for lighting purposes were both inspected. This latter engine is coupled direct with a Crompton continuous-current dynamo, and is capable of giving an output at 100 volts. No gas is used on the premises at all, everything being illuminated by the electric light produced from the burning of the refuse, without the aid of coal or coke. Finally the party were shown the mortar mills. Fifty tons of clinker are formed every day in the cells, and for dealing with this two mortar mills, a concrete flag-making plant, and a clinker-breaking and screening plant have been erected. The clinker is brought direct from the cells in side-tipping hopper wagons. The destructor is worked with a minimum of nuisance. The flues and arches do good work in creating such intense heats that all offensive

odours are completely destroyed in the burning of the refuse, and in addition a large dust-catcher, made by means of a specially long flue chamber, passes round the steam boilers and under ground for a considerable distance. The visitors from other towns took a great interest in everything in connection with the destructor, and satisfaction and even admiration were expressed freely in regard to the economical but thoroughly effective manner in which the work is carried out.

After photographs had been taken of the party the conveyances were again brought into requisition, and a start made for Kelham Island, to go over the Corporation tramways power station there. The visitors were met by Mr. A. L. C. Fell, M.I.E.E., general manager of the Corporation tramways, who, together with Mr. Yerbury, the assistant electrical engineer at the station, and Mr. A. H. Lowe, the mechanical engineer, conducted the party over the premises. Dr. Manton also joined the group here. The great generating engines attracted much attention, whilst interest was shown in the ammeters, which measure the amount of power being used by the cars running on the various sections of the tramways. The difference between the steadiness of the indicator of the ammeter for the Tinsley section and the fluctuations, amounting to as much as 100 ampères at a time, in that for the Walkley section, excited a good deal of surprise, and gave those present a fair demonstration of the hilliness of the Walkley route. A visit was also made to the basement, where, after much subterranean dodging of pipes, cylinders, &c., more boilers were shown, and also the cables along which the electric power is carried to the trolley wires.

Leaving the power station, the party next proceeded to the Westminster Hotel, where lunch was served.

After luncheon the quarterly meeting of the Association took place in the ante-room of the Council Chamber at the Town Hall. Mr. J. M'Taggart (Bradford) presided. The minutes of the previous meeting were read by the Hon. Secretary (Mr. W. Brockeman), and were unanimously adopted. It was announced that the date of the annual meeting had been fixed for from June 26th to June 29th, and that it was to be held in the city of Liverpool. It was resolved that the following five gentlemen should be asked to read papers at this annual meeting:—Messrs. Brockeman, M'Coll, Plant, Holt, and Smith.

Mr. Jackson proposed that Mr. J. C. Davidson and Mr. B. Brammer, both of Sheffield, should be elected as associate members of the Association. This was carried.

Mr. Jackson proposed that at the annual meeting Mr. M'Arthur, of Dundee, should be proposed as president of the Association for the ensuing twelve months.

Mr. Darley (Leeds) said that he thought this rather a strange request, as Mr. Jackson was himself in the running for the presidency. Did he understand that Mr. Jackson waived his claim to the position for next year?

Mr. Jackson said this was so. The annual meeting next year was to be held in Scotland, and he thought it more appropriate that Mr. M'Arthur should be the president on that occasion.

Mr. Downey, the treasurer, asked whether the banking account might be transferred from the Sheffield and Hallamshire Bank to the Yorkshire Penny Bank.

He was authorised to do this.

This concluded the business.

The delegates then adjourned to the Council Chamber for the purpose of hearing a paper read by Mr. James Jackson, Superintendent of the Cleansing Department of the Sheffield Corporation, on the subject of "Cleansing Work in Sheffield."

Mr. Jackson commenced by referring to the rapid growth of the city during the past ten years. The present area of the city was 19,651 acres, and this in October would be augmented to 23,266 acres, which he believed would be larger than that of any other provincial city. Further, the city contained 80,500 houses, and of this number no fewer than 9000 had been erected during the past four years. The number of loads of house refuse removed was 158,000, and this was increasing by about 8000 loads per annum. The work of the cleansing department in Sheffield practically never ceased, the whole of the machine street sweeping and removal of house refuse being carried out at night, while streets were hand swept and watered during the daytime. Cleansing work in all towns depended entirely upon local conditions, and he knew of no town where the conditions were more marked than they were in this city. Sheffield was built "without back streets," the result being that in almost every case refuse had to be brought a considerable distance before it could be put into the cart. In thousands of cases, too, steps had to be contended with. The only cities which could be compared with Sheffield were those built on the flat system, like Glasgow and Edinburgh. Nearly three-quarters of the ashpits of the city were on the privy-midden system, and the work of collection was consequently often carried out under most unpleasant conditions. The Corporation, however, were converting old middens at the rate of about 235 per annum, and all new houses were compelled to adopt the water-carriage and dry ashpit system. The advantages and drawbacks of the portable bin system were next dealt with by the speaker. He said that he was thoroughly in favour of the system for the majority of the large towns, and the present system of working in Sheffield being decidedly wrong, the sooner steps were taken to put it on a proper basis the better. The bins could not be introduced into this city to be as cheap as the fixed dry ashpit system; but from a sanitary point of view the difference in cost was over-weighed. He was sorry to say that the means of disposal in Sheffield were very limited. They had two tips, one siding for loading wagons for farmers, and one destructor. The Council had decided on the erection of another destructor at Penistone-road, and a commencement had already been made with the building of this. A third site had also been purchased for the erection of a six-cell destructor at Crookes. They at present collected about 500 tons of refuse daily in the city, and when the two proposed destructors were completed, he thought it probable that they would still have 150 loads per night going to tips, and it would be necessary to erect two more destructors. Mr. Jackson proceeded to give some particulars in regard to the working of the Lumley-street destructor, and then spoke briefly on the street cleansing of the city. Sheffield had about 320 miles of paved streets, he said, and with the exception of two small districts at the west end of the city, they were all cleansed by the Cleansing Department. He believed that they had a greater length, both of macadam roads and of wood paving than any other town—two extremes which made the work of street cleansing very difficult. The wood pavement had to be watched with the greatest care, while the large amount of *débris* to be carted from macadam roads during heavy seasons was sufficient to upset any system of street cleansing, particularly if a few main roads were in a bad condition. The department employed 605 men and 258 horses, and as showing the busy traffic which prevailed in some of our streets, he said that from records taken, as many as 6000 vehicles had passed certain points within eight hours. Like the disposal of house refuse, an ever-increasing difficulty was found in procuring easy places for the disposal of sweepings. Until quite recently they had been favoured with a tip not far from the centre of the city, but this was now closed, and his committee had had to purchase about fourteen acres of land for the purpose, at a cost of £6200. The

new tip was a distance of two miles from the city. In conclusion, he said that many Authorities owned and worked their own tramways, and no better way could be adopted than by using this means of haulage. It was necessary that sweepings should be taken as quickly as possible from the streets, and, seeing that most tramways were practically free from midnight until about six a.m., advantage should be taken of so ready and quick a means of transit. If the traction was electric it was necessary to keep the boilers working the whole of the night, and a little extra fuel would take the load of sweepings. Convenient loading shoots throughout the cleansing area would be needful, the refuse being tipped direct from the wagons into the trucks. Municipal progress had made rapid strides during recent years, and it was pleasant to notice a disposition on every hand to give more attention to what was regarded as the most important part of the work of a Local Authority.

The usual votes of thanks terminated the proceedings.

BUILDING TRADES EXHIBITION.

[Fourth Notice.]

The utilisation of the refuse of towns for practical purposes has been admirably solved by Meldrum Brothers, of Manchester. There is no reason why any township should not have its own electric installation and obtain the power from its own dung heap. At Hereford the sewage farm is now worked entirely with power from refuse, and the saving in coal alone is £450 per annum. Messrs. Meldrum have erected an electric installation at Darwen and also a refuse destructor, which supplies the power to light the town. Messrs. Meldrum had a model of the Darwen installation of their patent regenerative refuse destructor at the Building Trades Exhibition. It appears that alongside the electricity works, so as to make the steam main as short as possible, is the refuse-destructor plant. The slope in the site of the ground was specially useful in planning this installation, as it made unnecessary the construction of an inclined approach. The front of the refuse destructor was, for the sake of appearance, built of brick, but the rest of the building is of corrugated iron fixed upon a strong angle and tee iron framing supported by cast iron columns. Iron has been used throughout, as it was necessary to have the building absolutely fireproof, and to make it possible to wash it easily and thoroughly. The refuse is carted to the approach road in no less than five different ways, so that this traffic, which, if concentrated in one or two thoroughfares, might be deemed objectionable, is so scattered that it does not form a noticeable feature in any one street. On entering the destructor yard the carts are driven directly on to the upper floor or tipping platform. This occupies the full extent of the building, entirely covering the destructor cells and boilers below. The platform measures 100ft. long by 30ft. wide. Plenty of room is thus secured for unloading the refuse into the hoppers, the carts being driven in as they arrive, backed up to the hoppers, into which the loads are tipped without any manual labour. The work of unloading is thus performed in a few minutes, and considering the nature of the refuse there is surprisingly little dirt or odour about the building. The floor of the tipping platform is formed of concrete and steel joints carried by the iron pillars supporting the building. The upper surface of the floor is hardened by two layers of specially-made hard Limmer asphalt. This gives a hard, smooth, and very durable wearing surface, which can readily be cleaned. Good light and ventilation is obtained by a glass and zinc clerestory roof, extending the full length of the building. The hoppers are all on one side, and have sufficient capacity for one day's supply of town refuse. A circular staircase leads down from the tipping to the ground floor, where the cells, boilers, and other apparatus is placed. On the right, as one descends the stairway, is the lower part of the refuse hoppers, from openings in which the refuse is now shovelled by hand into the destructors just opposite. Besides the ordinary refuse, the fish offal from the market, and that from the public abattoirs, is consumed. It is thrown on the fire from iron pails holding about 80 lb., and although the fire is temporarily deadened it is not sufficiently interfered with to affect the supply of steam. With the normal tramway or lighting load taken singly it is unnecessary to use any coal.

Messrs. Pullman and Mann, of Leeds, exhibited—in addition to their brick, tile, and sanitary brick machinery—their patent steam cart, which comes under the Motor Cars Act, and carries up to five tons. This cart burns ordinary gas coke, does not damage the road, requires no licence, and only one man is needed to attend. Sanitary and Municipal Authorities might find use for steam carts in distribution from their brick, coal, and stone yards.

Mention was early made of the special exhibits drawn together under the auspices of the proprietors of the *Surveyor;* and as a matter of fact notices appeared of the wares of the principal exhibitors. The Chloros distributor was described and illustrated recently; also the exhibits of the Albion Clay Co., Messrs. Ham, Baker, and Co., E. Allcott, Ames Crosta Co., Septic Tank Syndicate, &c. But, in addition, Mr. J. Smith, of Coldharbour-lane, had forwarded some samples of stoneware pipes, bends, junctions, &c., fitted with Mr. Ernest Smith's patent joint, in which an iron socket and spigot is applied to a butt-ended stoneware pipe by means of imperishable cement. There were several exhibits of great interest to surveyors and builders, but the most attractive was the level used by the late Thomas Telford, the famous engineer, in constructing the military road between Edinburgh and London.

In the Gallery Annexe, which was also the reception room of the Institute of Clayworkers, were displayed on the walls a great number of architectural drawings, which were no doubt of considerable value to students and others.

The Smoke Abatement Exhibition was held in King Edward's Hall, but the specialities were neither new nor original, and are as familiar to our readers as household words.

Fire prevention found representation in the Minor Hall, and comprised twenty-one exhibits. Sections were shown of Columbian fireproof concrete floors as constructed of patented ribbed steel bars and stirrups embedded in concrete, and a section showing the method by which columns, stanchions, and joists are cased in with concrete. Silicate cotton, or slag wool, was shown by Messrs. J. C. Broadbent and Co., and the uses to which it is applied, shown in fireproofing partitions and floors. This slag wool is a pure mineral fibre made from Cleveland blast furnace slag, and is able to resist sound, fire, frost, and vermin. Loose slag wool may be sandwiched between wire-netting, and also in combination with plaster. Similar models were shown by F. Jones and Co., D. Anderson and Sons, and F. McNeil and Co. The New Expanded Metal Company had a useful display; and also the Mural and Decorations Syndicate, Limited, in the application of their patent terra-cotta and wire-lathing for fireproof partitions. The British Luxfer Prisms were again to the front as in Central Hall, and also the Fireproof Partition Syndicate, Limited, who exhibited a very neat and effective gate-keeper's office, the whole constructed of dovetail corrugated metal sheeting. Messrs. J. A. King and Co. showed their "Mack" patent fireproof and sound-proof slabs and blocks as used for forming

partitions, floors, ceilings, &c. The slabs have hollow reeds embedded in a specially-prepared plaster. Non-inflammable wood and fabrics were subjected to severe tests, and a section of Pease's fire-resisting cross flooring, and a small working model were in evidence. Altogether this section was very attractive.

MUNICIPAL ENGINEERING & SURVEYING.

CROSS-TABLE CHAT.

The dissemination of knowledge as to the character and size of the infinitesimally small organisms which perform such marvellous work in the bacterial purification of sewage proceeds slowly after all, and one hears some very funny, albeit quite true, stories anent this prevailing ignorance. As further illustrative of this, the manager of a well-known sewage works on the bacterial system has been good enough to send me a letter which he recently received, which runs as follows: —"Can you let me have some bacteria to put into a sewage tank on Wednesday morning? I know these animals will breed themselves, but I want some if you can send them to make a little show"! This gentleman evidently fancies that bacteria are a sort of cockroach, and can be obtained at so much a dozen, whereas they are so minute—being no larger than from $\frac{1}{3000}$th to $\frac{1}{25000}$th of an inch—that they are never visible to the naked eye, but require the most powerful microscope for their discovery. I am not told whether these animals were packed off as requested.

I observe that a number of local surveyors in the Thames Valley have announced that they have formed a local organisation under the title of The Lower Thames Valley District Surveyors' Association, for the purpose of discussing matters and practice as affecting the areas of their several Authorities, more especially the administration of bye-laws and regulations, and for securing uniformity of procedure in relation to gas, water, electric light, and tramway companies. The idea is not a new one, as I have heard of several instances where, for some years, surveyors of neighbouring Authorities—to the number of about half a dozen—have grouped themselves together for a similar purpose, and held monthly meetings without ostentation or public notice alternately at each other's houses, and discussed over "a pipe and a friendly cup or glass," the intricacies of building bye-laws, so as to lead to a common interpretation of such bye-laws, and generally for the discussion of matters affecting their districts, to the great advantage of every one concerned, and also that of the districts affected.

I am not sure whether the objects and usefulness of these friendly meetings are not better secured by restricting the number of members so as to limit them to friendly "parlour" gatherings where the proceedings are informal and without restraint and rules rather than to extend them to formal discussions and the reading of papers, but I would suggest that the multiplication of these friendly associations be extended for the mutual benefit of surveyors, who would derive much pleasure and enlightenment from them. The newly-formed association announce that "it is not in any way intended to clash or interfere with the work of the parent organisation," from which one gathers that the Incorporated Association of Municipal and County Engineers is meant. It is not quite obvious as to why they should have been so anxious to disclaim this, except to utilise it as a negative way of censuring the Association, and from what I hear this is the generally-accepted view in which it is held.

I have from time to time voiced the opinions of members of this Association in this column as to the neglect of their interests, and of the lack of capacity of the Council in initiating any measures to extend the usefulness of the organisation. It is an unpleasant feature — which the Council should strenuously endeavour to correct—that there is widespread dissatisfaction among the members as to the mismanagement of the Association, and as business men the condition of affairs reflects adversely upon them. Whilst pointing this out, I am bound to say that the individual members cannot shift the whole responsibility on the Council. The latter are elected by the votes of the members, and are therefore their creation. If the Council do not acquit themselves of their duties to the satisfaction of the members, the latter should nominate and elect men independently of those suggested by the Council. New blood is urgently required, and a fair proportion of the Council should be composed of younger men rather than that it should almost entirely consist of men who have grown grey in the profession. Inasmuch as the election of the new Council for 1901-2 will take place almost immediately, nominations should be sent in without delay if members are in earnest.

It is interesting to observe how the gentlemen with a mechanical "bend" have taken the opportunity created by the introduction of the bacterial system of sewage disposal to turn their inventive capacity to account in designing apparatus for the automatic charging and discharging of bacterial beds. Messrs. Cameron, Commin, and Martin, of the Septic Tank Syndicate, were the first to bring out a patent which, as is well known, is on the bucket principle. Then followed Mr. S. H. Adams (Messrs. Adams and Co.), York, with their system of controlled syphons; and Messrs. Mather and Platt, Manchester, with valves set in a chamber opened by a cam-and-ratchet arrangement actuated by the rise and fall of sewage in a storage tank; Mr. C. F. Dixon, of Low Hall Mills, Holbeck, Leeds; and now Mr. Joseph Graham, of Bank-chambers, Bank-street, Carlisle, has introduced an apparatus which he claims to be simple in working, and that by its use there is no loss of head. Municipal engineers have ample choice as to the kind of apparatus which will best suit their requirements.

I have before this acquainted my readers with new methods for obtaining high pressure gas in incandescent lamps for lighting refuges and open places. Progress with the development of intensified gas lighting is rapid; and, light for light, electricity is now considerably behind gas when cost is also taken into account. The latest departure of which it is necessary that my readers should be kept informed is the Scott-Snell self-intensifying gas lamp for street lighting. Hitherto where intensified gas has been introduced the means of obtaining the required pressure has been by a water-motor or other apparatus, and the employment of a second set of pipes. This meant that the system was only available and practicable in large open spaces, railway stations, &c. Mr. Scott-Snell has, however, improved greatly on this, and his lamp requires no mechanical compressor, and yet it is capable of supplying gas at any pressure from 4in. to 20in. The power is derived from the heat of the burning gas, and is generated in each individual lamp. There are practically no mechanical moving parts, and the apparatus is extremely simple. The lamp may be fitted to any existing column, and its cost is not prohibitive. It is manufactured by the Scott-Snell Phillips Syndicate, Limited, whose offices are 51, Victoria-street, Westminster, S.W., to whom my readers should apply for further particulars. I am of opinion that this system has a good future before it. Senex.

NOTICES.

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The Sanitary Record

AND

Journal of Sanitary and Municipal Engineering

MAY 16, 1901.

REFUSE REMOVAL AND DISEASE.

WITH the hot summer days close upon us, bringing in their wake an increased liability to outbreaks of diphtheria, and the inevitable visitation of summer diarrhœa, the question of improved systems of refuse removal is once more brought into prominence. Many Sanitary Authorities have already had the matter brought under their notice by their Medical Officers, and we feel called upon at this juncture to impress upon those who have not yet moved in this direction the urgency of doing so without delay. Prompt action may mean the avoidance of many ills which would otherwise result in the event of neglecting such simple precautions as are generally recommended for adoption. A timely note of warning comes from the borough of Hampstead in the shape of a report of Dr. E. Gwynn, Medical Officer of Health for the district, who urges in the strongest terms the necessity for making a collection of dust and house refuse twice a week during the summer months instead of once a week. He emphasises his recommendations by pointing out that there are 152 blocks of flats in the borough in which the refuse is generally stored in a well-like courtyard, from which the effluvia rises and passes into the bedrooms. That he has good reasons for insisting upon this additional precautionary measure is made evident by a case which recently came under his notice in which an outbreak of diphtheria occurred where the dust-bin was in the proximity of the children's playground. Although the recommendation in question was practically limited to flats, tenement and registered houses, and public institutions, Dr. Gwynn expressed the opinion that it would be well for the Council to go a step further and consider the advisability of undertaking a twice-a-week collection for the whole borough—a question which will have to be considered in the near future. Of course, the report has yet to be considered, but we feel certain the Borough Council of Hampstead will act upon its recommendations; indeed, we hardly fail to see how they could well do otherwise. With such an example before them, other Councils should not be behindhand. Hampstead is far from being the only borough where a similar need exists, as the annual reports of Medical Officers show. As might be expected, there are members of public bodies who will make it their object to cavil at any extra expense incurred by the process of a more frequent collection of house refuse, and a case in point has just occurred at Chingford. Here a somewhat similar recommendation, backed up by both the Medical Officer and the Sanitary Inspector, was made the subject of a lengthy discussion, in the course of which it was evident that a trifling saving in pounds, shillings, and pence, was considered by the majority far and away paramount to considerations of public health. This was what the opposition amounted to in effect. Common sense, however, asserted itself in the remarks of Dr. Cruickshank, who pointed out that the Council had to look after the health of the parish, and all sanitary matters should receive consideration when brought forward. The mover of the amendment, he went on to observe, said that sanitation was not the point before them, but he submitted that this was the point, and that they should take notice of it in view of twenty or thirty cases of infectious disease. Another speaker drew attention to the fact that the Council paid £199 5s. last year for the isolation of infectious cases, a large part of which might, in all probability, have been saved had the refuse been collected weekly. In the end the amendment was carried, and the matter went back for further consideration. No doubt there will be the usual delay in such cases, while in the meantime, if hot weather sets in, the accumulated rubbish will be allowed

to pollute the atmosphere and breed fresh cases for the isolation hospital. We have dwelt upon this particular case as likely to be typical of many others in this country, and it only furnishes another example of the anomalous position of the Medical Officer of Health under present conditions. It is nothing short of iniquitous that men of education and experience in these matters should have their recommendations set aside in this way. What is the use of the Medical Officer of Health at all, unless his directions in a simple yet important matter of this kind are carried into effect?

Lectures to Health Officers.

The series of lectures now in course of delivery at Leeds, under the auspices of the West Riding County Council, promises to be one of the best things yet done by the county Authorities to help Sanitary Inspectors and others in the more efficient performance of their duties. We are glad to announce that it is intended to give them a wide circulation. In addition to their publication in the columns of The Sanitary Record, they will be reprinted and published at a nominal price. The lecturers are all well-known and experienced men, and they are treating their subjects in a thoroughly up-to-date manner. In this way all aspiring to positions in the sanitary administration of the country will have placed before them the very latest practice, and will receive material assistance in preparing for examination under the various certificate-granting Boards and societies. But we are hopeful that the action of the West Riding Council will have a still greater influence, and that other counties will be encouraged to follow the example thus set. We rejoice to know that a similar movement has been started in New South Wales. The chief health officers of Sydney, with the sanction of the City Council, are making arrangements for the initiation of a systematic course of lectures on practical hygiene, and all subjects appertaining to public health, to every municipal employé who cares to avail him or herself of the opportunity. The Mayor has entered most heartily in the project, for he believes that it is only by such means that the "Municipalities in the metropolitan area will become supplied with officials who are able and efficient in sanitary matters." Cannot the London County Council arrange for some such work to be undertaken in the autumn of the present year? The cost would be small, but the benefit would be exceedingly great.

An Indian Town.

It is well that those at home should be kept alive to the great work that is needed in India. To fight famine and plague it is not necessary to increase our armies and military establishments. India needs more peaceful measures. Every paper that comes to us tells the same story. Sanitary works are the need of our distressful subjects, and until these are increased, plague, pestilence, and famine will continue their dire destruction. One extract from this week's mail will suffice to emphasise this point. It is only one of many. We are told that the town of Nellore is in a dreadfully insanitary condition. Major Grant, I.M.S., Deputy Sanitary Commissioner, in his inspection notes calls attention to several grave sanitary defects, of which the chiefest would appear to be the fouling of the water-supply of the Nellore tank by fæcal matter and the burning of corpses near one of the supply channels. As the Sanitary Commissioner sarcastically says, there are ratepayers in the town, who use the Nellore tank, who would feel grateful if the Council no longer required them to drink water in which fæcal matter is an unnecessary addition, and there may be others who, using the river water, might be pleased to know that they are not imbibing a solution of corpses. Both the Deputy Collector and the Collector endorse the remarks, and suggest that the Municipality should be ordered to report periodically on the steps taken to remove these sanitary defects. The Collector says that the water supply and drainage for Nellore have long been pressing necessities, and suggests that steps, such as raising the maximum of taxation, should be taken to remedy these defects.

Rochdale Sewerage.

It looks as if matters were at last coming to a head over the dispute between the Rochdale Town Council and Mersey and Irwell Joint Committee. The latter has long complained of the character of the effluent discharged from the sewage works of the town in the stream under its control. Nor have the Rochdale people been unmindful of the defects of their system. Many hundreds of pounds have been spent in experiments to try and find a remedy, but up to the present they have failed to satisfy the demands of the Committee. Last February the Town Clerk wrote to the Committee giving an outline of a scheme, and giving approximate estimates for an installation of bacteria beds for dealing with the sewage of the borough. But it was also pointed out that if these plans were adopted an expenditure of £40,000 would be involved, and therefore the Town Council asked for time to continue experiments so that the efficiency of the trial beds might be fully demonstrated before this large expenditure was undertaken. In the intervening time the estimated expenditure has reached £50,000, and still the Town Council cannot make up its mind what to do. Under the circumstances, the Rivers Committee at its meeting last week threatened to apply for a summons, and it was only on the urgent appeal of the local representative that action was deferred for a month. This further extension will be the full limit granted by the Committee, and it is to be hoped the Council will realise that it is useless to delay action any longer. We fully admit the difficulties of dealing with the sewage of manufacturing towns. Each one has its peculiarities. Yet too much time may be exhausted in experimenting, and often it is only made the excuse for delay. Of course the heavy expenditure is not a pleasant prospect for Rochdale, but then the Town

Council knows that it is inevitable, and the longer the decision is delayed the more expensive will the work become.

A Vacancy at Cape Town.

The methods of doing business by the Council of Cape Town have been subjected to very strong criticism from time to time. At last, however, this body appears to realise that other than local responsibilities rest upon its shoulders. Just now, considering the enormous traffic passing through the place, Cape Town occupies an absolutely unique position, and it is of the utmost importance that its health bill should be kept as clean as possible. Dr. Fuller, for various reasons, has resigned the Medical Officership, and the Town Council has decided to advertise in England for a successor. This action has been condemned by some of the Little Africanders, who appear to think that the district contains plenty of men qualified for the post. To a certain extent this may be true, but with plague and small-pox in its midst, the town requires the services of a man of the very widest experience, and also one who is entirely independent of local influences. But the salary offered is insufficient for the enormous responsibilities accompanying the office. True that £800 is £200 more than was originally recommended for the position, but it is not enough to entice men from the comparative safety of a home practice to the deadly surroundings of a country into which the very dregs of humanity are being deposited. It is worth at least £1000, and even then for the man to be successful he must be backed up by a good assistant and an efficient staff of Inspectors. As we have stated, Cape Town is no ordinary place. Its existence depends upon its commercial supremacy, and let its harbour be closed because of plague and disease, there is nothing but decay and ruin before what should be the first town in South Africa.

Heavy Mortality Rates in Edinburgh.

Sir Henry Littlejohn's report on the health of Edinburgh during the month of April shows an exceptionally high death-rate owing to an epidemic of measles and whooping-cough. The average rate for the corresponding month during the last five years is 18·75 per 1000; this year it is 22·34. The only year of the past quinquennium in which the rate for the month stood higher was 1897, when the rate was 25·20, the abnormal mortality being due to the very same causes. The total number of deaths in Edinburgh last month was 569, the principal causes being phthisis (47), other forms of tuberculosis (24), other chest diseases (196), measles (31), and whooping-cough (59). The deaths from the causes named reached a total of 357, as against 248 due to the same causes in April of last year. Sir Henry points out, as a feature of some interest, that of the 31 reported deaths from measles, only 8 occurred in the City Hospital, while only 5 deaths from whooping-cough occurred in the hospital out of the 59 reported. In another return, dealing with the intimations of infectious diseases, he brings out the rather striking fact that 1100 cases of infectious disease were reported in April, as compared with only 369 in the corresponding month of 1900, and that out of this total of 1100, no fewer than 1013, or only 87 short of the entire number, related to measles. The average number of intimations during the previous five years was only about 600, although in 1897, the year already referred to, they reached 1830 in number. These are some of the most salient features of a very interesting report.

The Malaria Investigations.

The Liverpool School of Tropical Medicine has issued a statement on the subject of the prevention of malaria in tropical countries, which summarises the knowledge acquired from the most recent investigations. The principal difficulty in prosecuting experiments hitherto has been the want of funds; but it is now announced that a leading citizen of Glasgow has placed at the disposal of the School and of Major Ross a large sum of money, sufficient for one year's thorough trial in some malarious city. A staff of workers is accordingly to be despatched by the School, who will attack the mosquito both in its adult form and as larvæ in pools of water, with the ultimate hope of practically exterminatting the pest. The selection of the town has yet to be made.

National Health Society.

OFFICIAL TRANSACTIONS.

Lectures at 53, Berners-street, W.—The special lectures organised by the Association of National Health Workers were continued during last week as follows:—On Wednesday, May 8th, Dr. Gay lectured on "Disinfectants," Dr. Christopher Childs acting as chairman on this occasion. On the following day, at 5.15, Dr. Robert Bowles gave a most interesting lecture on "The Physical Relations of the Tongue, Nose, and Throat in various States of Unconsciousness." Mr. Bowles demonstrated in a most convincing manner the superiority of the Marshall-Hall method over the more generally adopted Sylvester method in the restoration to life of those apparently drowned. He showed how the position of the unconscious patient was often a matter of life and death, how the mere fact of moving a patient from off his back on to his side would, in some cases, be the means of saving his life. This lecture will be reported as fully as possible later, but as Dr. Bowles used several carefully-prepared diagrams and various apparatus, members of the Association who are interested in the subject, and who were unable to attend the lecture, are advised to read Dr. Bowles' book, "Stertor and Apoplexy," published by Baillière, Tindall, and Cox, the book being fully illustrated by diagrams, &c. Dr. Owen Lankester took the chair at Dr. Bowles' lecture. In the evening of the same day Dr. Squire lectured on the "Open-air Treatment of Consumption," or, as he prefers it called, the "*Hygienic* Treatment of Consumption." On Friday evening Dr. Steegmann lectured on "Vaccination," Dr. Kenwood taking the chair.

Sanitary Inspectors' Associations.

NATIONAL UNION.

A CONFERENCE of the North-Western District Centre of the National Union of Sanitary Inspectors was held on Saturday afternoon in the Co-operative Hall, Manchester, Mr. James Mort (Lynn) presiding. Mr. F. J. Rowe (Sanitary Inspector of Manchester) read a paper on "Bakehouse Reform," in which he spoke of the changes which had taken place in this district in this matter. He discussed the law relating to bakehouses and dwelt on the prospects of the future, referring in conclusion to the possibilities of co-operative action in the way of reform. A discussion followed.

THE SANITARY INSTITUTE.

AT an examination in Practical Sanitary Science, held at Sydney, N.S.W., on January 12th and 19th, 1901, three candidates presented themselves. A certificate has been awarded by the Council of the Institute to the following candidate:—F. W. Lawson.

At an examination for Inspectors of Nuisances, held at Sydney, N.S.W., on January 12th and 19th, 1901, forty-nine candidates presented themselves. Certificates have been awarded by the Council of the Institute to the following candidates:—F. W. Barber, T. Connell, E. Cresswick, F. A. Cuddy, F. Davis, R. M. De Carteret, J. Duncan, A. E. Field, R. A. Fraser, W. E. Gundry, T. A. James, T. F. Joyce, K. B. Kenway, G. T. Law, F. Letchford, B. Lloyd, T. A. Lloyd, J. V. Lovegrove, P. Murphy, D. Owen, J. P. Palazzi, F. J. Paris, J. J. Skelton, J. D. Smith, F. G. Tuck, A. E. Wadsworth, H. G. Wills, J. J. Wright.

At an examination in Practical Sanitary Science, held in London on April 26th and 27th, 1901, twelve candidates presented themselves. The following candidates were awarded certificates:—F. Elgar, G. B. Grave, K. Gray, P. B. Sands, R. Wood.

At an examination for Inspectors of Nuisances, held in London on April 26th and 27th, 1901, 113 candidates presented themselves. The following candidates were certified, as regards their sanitary knowledge, competent to discharge the duties of Inspectors of Nuisances under the Public Health Act, 1875:—Miss J. Agnew, A. Anderson, W. A. Austen, W. J. Barker, G. F. Barnes, S. P. Beal, Miss E. I. Beeston, Miss M. G. Bhose, Miss A. E. T. Biggs, S. T. Bocock, A. E. Bonham, A. Burgess, J. J. Burgess, W. J. Burrows, C. E. L. Canham, R. E. Clarke, J. S. Clements, J. Cooper, L. Crawshaw, W. Fanner, C. W. Fisher, Mrs. T. Fisher, D. J. Ford, F. F. Fulker, R. H. L. Grontage, G. B. Hartfree, M. J. J. Hillyard, Miss M. F. Hoc, A. W. Holley, H. C. Hunt, J. Jackson, W. Jones, J. J. Kennan, R. R. Knight, W. G. Lane, A. W. Lucas, H. Martin, A. Matthews, C. Mitchell, P. Morgan, T. L. Morley, G. L. Murray, T. B. Phillips, T. E. Phillips, A. E. Platford, J. W. M. Rapley, W. Scothern, F. Sheriff, T. V. Smith, E. J. G. Sinnett, J. Thomson, C. D. White, J. E. Whitehead, R. Wickham, D. W. Windmill.

At an examination for Inspectors of Meat and other Foods, held in London on May 3rd and 4th, 1901, nine candidates presented themselves. The following candidates were awarded certificates:—A. J. Hocken, Veterinary Lieut.-Col. J. A. Nunn, F.R.C.V.S., D.S.O., C.I.E.; J. Roberts.

THE Cleansing Committee of Aberdeen Town Council has agreed to recommend the construction of a lavatory in the vicinity of Torry Harbour, at a cost of £400. It has also been resolved to construct a lavatory near Wellington Suspension Bridge, between Menzies-road and Wellington-road, at an expenditure of £425. The Committee further sanctioned the construction of a lavatory in Hutcheon-street, opposite the new dead meat market.

Public Works.

SEWERAGE.

THE Northwich Rural District Council has decided to apply to the Public Works Loan Board for a further advance of £1000 for the Winnington sewerage works.

THE Halesowen District Council has decided to apply to the Local Government Board for sanction to an additional loan of £1438 required for the completion of the Hill sewerage system.

THE Bridlington Council has received sanction to the borrowing of £5960 for the purposes of a main drainage scheme prepared by Mr. E. R. Matthews, C.E. The work is to be proceeded with at the close of the season.

AT the last monthly meeting of the Quorn Urban District Council, it was resolved that Mr. Simpson's sewerage scheme be accepted, and that formal application be made to the Local Government Board for sanction to borrow the necessary sum to carry out the proposed works.

A LOCAL Government Board inquiry has been held at Branksome by Colonel A. J. Hepper, R.E., D.S.O., into an application by the Branksome Urban District Council for sanction to borrow £1687 for the purchase of land for purposes of sewage disposal. The purification works will be on the septic tank system.

LEEDS has been placed in a perplexing position by the rejection of the sewerage scheme of the Corporation by the House of Lords Committee. The Gateforth estate was purchased for £85,000 to carry out the scheme, and the Corporation had obligations with the West Riding Rivers Board which cannot now be fulfilled.

THE Hanley Town Council has accepted the tender of Mr. W. Williams for the provision of an additional settling tank at the sewage works, amounting to £1560, and has decided to make application to the Local Government Board for permission to borrow £4000 required for this, and two new boilers and extensions to the boiler-house at the sewage works.

THE proposals of the Burton Corporation Bill were further considered last week by the Select Committee of the House of Commons. Evidence formally proving the preamble was given by Mr. Whitehead, the Town Clerk, and Mr. Lyneham, the Borough Engineer, and, the preamble having been declared proved and the clauses adjusted, the Bill was ordered to be reported for third reading.

AT the annual meeting of the Ledworth and Mellon Sewage Board it was stated that, acting on instructions, Mr. Garside, the engineer, had altered the plans, &c., of the sewage outfall works, bacteria beds, &c., so as to reduce the first estimates of £9000 to over £7000. The Board instructed Mr. Garside to proceed with the alterations, and prepare his plans, &c., for formal inspection and approval by the Local Government Board.

A LOCAL Government Board inquiry was held at Romford last week with reference to an application by the Urban District Council for leave to borrow £1100 for works of sewage disposal at the sewage farm, Britton's Farm, Hornchurch. Mr. Winmill explained the scheme, saying the present storage capacity was 600,000 gallons. The new tank would be used in times of storm, the object being to store the overflow at times when the land was full of water from the natural rainfall.

THE Gainsborough Urban Council has decided to submit for the approval of the Local Government Board a scheme, estimated to cost £24,281, for the improvement of the sewerage of the town. Its object is to avoid the flooding of the lower portions of the town when the sewer outfalls to the Trent are tide-locked. The scheme provides mainly for a large intercepting sewer in Trinity-street between the hills and the lower levels and various intercepting sewers in other portions of the town. It also includes a collecting sewer, which, when outlets are tide-locked for twenty-four hours—which has occurred twice during the last nine months—could be connected by opening a sluice to each outfall sewer, and discharging into a sump well, where a hydraulic engine could be provided to raise the sewage into the river.

At the last monthly meeting of the Heywood Town Council, the Health Committee reported the receipt of a letter from the Local Government Board declining to sanction loans for the purposes of the refuse destructor and works of sewerage in Rochdale-road, until the applications with reference to the Botany and Heap Bridge sewage disposal works had been investigated. It was resolved that the Town Clerk be instructed to obtain and forward to the Local Government Board the information required by it in connection with the excess expenditure on the sewage disposal works at Botany.

At the last monthly meeting of the Altrincham District Council it was decided to make an application for a loan for £15,000 for the new sewage works. A Committee was appointed to inquire further into the agreement relating to the public control of Hale Moss, and to report to the Council. Mr. Vernon, in moving the appointment of the Committee, stated that the agreement was not carried out, although it cost the Council £270, because of some unauthorised verbal alterations which made it objectionable to the various Authorities interested. It was important to know by whom these alterations had been made.

A Local Government Board inquiry has been held at Cotherstone by Lieut.-Col. A. E. Smith, R.E., to inquire into the proposal of the Startforth Rural District Council to borrow £2650 for the sewerage and sewage disposal purposes at Cotherstone. The village is beautifully situated at the junction of the rivers Balder and Tees, and is growing in popularity as a summer resort, and is particularly patronised by persons desirous of a change whose vocation necessitates their living near the coast. The Engineer (Mr. Parker, C.E., of Newcastle) explained the scheme, and there was practically no opposition, though a special drainage area was suggested by farmers who live in the parish outside the area to be sewered.

At a recent Bewdley Town Council meeting it was reported that a contract had been entered into with Mr. Reading, of Wolverhampton, for £10,590, for carrying out the new water scheme, and the work was in full swing. The Council sealed an agreement with the Rev. S. B. Pendyre for the water rights, &c., for £800, and £64 costs, the lease being for 2000 years at an annual peppercorn rent. The Town Clerk said the Public Works Loan Commissioners had agreed to lend the Council £9026 at 3¼ per cent. interest per annum, repayable in half-yearly instalments, and the balance of the money required for the waterworks had been secured by the selling of Corporation stock. The General Purposes Committee reported that Mr. Berrington, C.E., had been instructed to prepare a sewage scheme for Bewdley and for the district which might hereafter be attached to it, and would present a report as soon as possible.

The Kingswood District Council has received a letter from the Local Government Board in reference to the inquiry held by Mr. Fawcett into the application of the Council for sanction to borrow £27,000 for purposes of sewerage and sewage disposal, and also into the propriety of the works proposed to be constructed outside the urban district, and into objections which have been made thereto. The Board was advised that the land at Cowhorn Hill, in the parish of Oldland, proposed to be accepted as a site for outfall works, was unsuitable for the treatment of sewage, and it would appear from the evidence given at the inquiry, and from the account given by Mr. Fawcett of his inspection of the site, that it was otherwise open to objection. The Board therefore requested the Urban District Council to re-consider its proposal; and as it would appear that there are portions of the rural district of Warmley which require draining, the Board suggested for the consideration of the Urban District Council whether it would not be desirable for the two Councils to combine for the purpose of carrying out a joint scheme of sewerage and sewage disposal for the areas, which would be conveniently drained to one outfall. In the event of a joint scheme being adopted, it might be found practicable and desirable to connect the sewers of the Conham portion of the urban district with the general system, and thus avoid the cost of constructing, maintaining, and supervising separate outfall works for different parts of the urban district.

The inquiry into the application of the Burton Corporation for power to acquire an additional 98 acres of land on which to treat the town sewage, was continued by the Committee of the House of Commons. Mr. Richard Sale, chairman of the Repton District Council, Mr. Bailey Denton, an engineer with twenty-five years' experience of sewage disposal; and Dr. Barwise, Medical Officer of Health to the Derbyshire County Council, spoke in opposition, the two last named advocating the adoption of precipitating tanks. Dr. Thresh and Dr. Samuel Rideal also condemned the present system. The Committee decided to grant the powers asked for, laying it down as a condition that the County Council should have power to take samples of the sewage before and after treatment, and throwing out a suggestion that a belt of trees should be planted between the sewage farm and the estate of Mr. Mosley.

WATER.

The Corporation of Doncaster has notified Sheffield that in 1902 it will require 375,000, and in 1903 400,000 gallons of water daily from the new source. From Thyrberg reservoir it is now receiving about 450,000 gallons daily.

The County Purposes Committee of the Corporation of the City of London has submitted to that body a report as to the Royal Commission on the Water Supply's suggestion that there should be a Water Board formed, consisting of not more than thirty members. No direct representation of the Corporation of the City was proposed, and the Committee recommended that it should be authorised to wait by deputation upon the President of the Local Government Board with a view to making clear the Corporation's position and rights in that respect. This recommendation has been adopted.

The Rhymney and Aber Gas and Water Company have now commenced to construct their reservoirs at Blaen-Rhymney. It is estimated that the whole of the works will occupy about three years to complete. The site of the works offers a natural basin for the storage of water, there being a short valley tapering on to the fringe of the Breconshire county. In all there will be three reservoirs, but the contractors will first proceed with the largest of the works, which is naturally the lowest site in the valley. The necessary machinery is now being conveyed on to the ground, and upwards of forty huts are being built to accommodate the workmen. When completed the reservoir will be the main source of supply for the whole of the Rhymney Valley.

A very interesting visit of inspection was recently paid by a large number of members of the Ipswich Scientific Society to the Waterworks. After tea the party proceeded to the old engine-house, where Mr. Howlet Roberts, A.M.I.C.E., the Waterworks Engineer, read a descriptive paper. The machinery, which was in motion, was then inspected, and attention was drawn to the plan of the proposed new reservoir on the Park-road. It will have a storage capacity of four million gallons of water, the dimensions being 290ft. by 20ft. with a depth of about 11ft. The concrete walls will be 10ft. thick in some places, and are calculated to withstand a pressure of 17,000 tons without the earthen embankments. The cost of the work will be something over £20,000.

Fresh litigation is threatened between the Swansea Corporation and the contractors of the Cray Waterworks. We understand that Messrs. Paterson and Son have served a writ on the Corporation in the High Court of Justice to have it declared that their engineers are not entitled to interfere with the methods of the contractors in the carrying out of the work, particularly in the lining of the tunnels, and also that, owing to the largely-increased work required in the deepening of the main dam, the engineers are not entitled to withhold the time allowance certificate (alleged to be provided for the term of the contract) for an unreasonable time. The contractors are also applying for an injunction restraining the Corporation from taking any action pending the hearing of this action, and are, further, claiming damages for alleged breach of contract. The action which we understand the Corporation are contemplating is that of appealing to the Higher Court for power to determine the contract.

At a recent meeting of the West Riding County Council, the Sanitary Committee reported in reference to the Thorne water supply question:—"Pursuant to the resolution of the County Council at their meeting on the 13th March, 1901, your Committee have made a representation to the Local Government Board, under Section 19 of the Local Government Act, 1888, in respect to the unwholesomeness of the existing water supply of the town of Thorne, in which the whole facts of the case are set out."

A Bill to enable the Corporation of Southport, the Urban District Council of Birkdale, and the Rural District Council of West Lancashire to acquire the undertaking of the Southport Waterworks Company, was last week before a committee of the House of Lords, the Earl of Jersey in the chair. The company is now a large and prosperous concern, with a capital of £425,000, and Mr. Pope, who appeared for the Local Authorities, said they made no serious charges against the management. The company last year applied for powers to construct new works and to obtain additional capital, and Parliament gave the company power to raise two-thirds of this capital, which, however, was not to be taken into account by an arbitration dealing with the question of the price to be paid for the undertaking, should Local Authorities agree to form a joint board and to promote a Bill for the purpose in the present session.

A Lords' Committee, with the Earl of Jersey in the chair, last week, began the consideration of a Bill to empower the Corporation of Barrow-in-Furness to extend its water supply. It was explained on behalf of the promoters that the proposal was to take water from the river Duddon at a point 17 miles above the town. A low weir would be made to dam up the water, and the Duddon being a salmon river there would be a fish ladder to satisfy the requirements of the Fishery Board. The Corporation asked to be allowed to take 2,000,000 gallons a day when the flow of the river was more than 5,000,000 gallons. When the flow was between 3,000,000 and 5,000,000 gallons they sought permission to take all over 3,000,000 gallons; and when the flow was over 15,000,000 gallons they asked for 3,000,000 gallons. To meet the occasions when the flow was less than 3,000,000 gallons, a reservoir would be made at the Seathwaite Tarn, some three miles to the north-east of the proposed Duddon intake, and about midway between Coniston Water and Wast Water. The level of the tarn was to be raised by means of a masonry dam some 21ft. high, and this would increase its storage capacity by some 275,000 gallons. The Corporation proposal was to take these 275,000 gallons as well as 175,000 gallons from the existing capacity of the tarn, and the overflow from the reservoir would go down the existing tarn beck. The drainage area dealt with was 12,000 acres, and its average daily water flow was estimated at 54,000,000 gallons. Of this amount the Corporation proposed to take only an average of 2,750,000 gallons.

The Sheffield Corporation reservoir at Langsett—one of the largest works of the kind now in course of construction—is more than half finished. The most important part of the work lies in the construction of the embankment. When complete, this will be composed of no less than 900,000 cubic yards of material, of which about 80,000 yards are represented by puddle. The latter figures relate to the trench which is in the centre of the embankment, and which is the mainstay of the structure. Water may penetrate the other material, but it can never force a passage through the puddle trench. The trench extends many feet below the surface of the old river course, and below ground forms a foundation for the remainder, and an effectual stop to any water which should make a way below the puddle, consisting of a solid mass of between 30,000 and 40,000 cubic yards of concrete. This measures 9ft. in width. The trench, which is composed of puddle, commences on the level of the old river at a width of 38ft. at the foot, and diminishes at the rate of 1 in 12 until the top is reached, when the width will be 9ft. The width of the embankment at the top will be 28ft., and 230 yards at the bottom. Its depth will be 100ft., and length 396 yards. The concrete part of the trench has been made, and the embankment has risen, roughly, 45ft. above the surface of the old watercourse. Up to the present 150,394 cubic yards of excavation have been contributed towards the embankment, and 20,000 yards of puddle. Langsett reservoir will have a gathering ground of 5203 acres, and will hold between 1,400,000,000 and 1,500,000,000 gallons. To fill it will take 12in. of rain, and it would be possible to put in the complete amount of water within a couple of months, but this would never be done, as it is not advisable to let the water accumulate at the rate of more than 6in. a day. The reservoir will cover 125 acres, and will be by far the largest of those belonging to the Sheffield Corporation.

LIGHTING.

Haverfordwest is to have a new gasholder at the municipal gasworks.

The Darwen Corporation has decided to spend £15,000 in additional works and mains for electric lighting.

The London County Council has agreed to lend the Stepney Borough Council £5160 for street lighting purposes.

Gasworks extensions and improvements at Yeovil will cost that town £10,000. A loan is to be raised by the Council.

At a recent meeting of the Malvern Urban Council it was decided to seek official sanction for a loan of £17,000 for carrying out of an electric lighting scheme and other improvements.

The Gas Committee of the Manchester Corporation has increased the price of gas within the city area from 2s. 6d. to 2s. 9d. per 1000 cubic feet, and in the outside districts from 2s. 9d. to 3s. per 1000.

A special meeting of the Harrow Urban District Council took place last week, for the purpose of considering reports and estimates from the Surveyor referring to the Pinner-road and Sudbury-hill drainage schemes, the public lighting, and the improvement of various footpaths.

The annual report of the working of the Southport Corporation's Gas Estate shows a gross profit of £16,083, and after paying interest and sinking fund charges, there is a balance of £5583, plus £1323, brought forward. It had been anticipated that there would be £8000 to hand over for the relief of the rates, but owing to the high prices of all classes of material used this sum is not reached by £1092.

The Poulton-le-Fylde Gas Bill last week came before Lord Morley, Chairman of Committees of the House of Lords, as an unopposed measure. Its object is to transfer the undertaking of the Poulton-le-Fylde Gas, Coal, Lime, and Coke Company to the Poulton-le-Fylde Urban Council, and to authorise that Council to supply gas. Formal evidence on the preamble having been given, the Bill passed the Committee, and was ordered to be reported for third reading.

There is at present under construction at St. Anthony's, for the Newcastle and Gateshead Gas Company, an immense gasholder, and some idea of the size may be realised from the facts that the work will cost £77,000, and that the holder itself will be in three lifts, each of a capacity of 15,000,000 cubic feet. About a score of members of the Newcastle Association of Students of the Institute of Civil Engineers visited the partly-completed steel structure last week and were shown over it.

The South Metropolitan Gas Company's Bill came on Thursday and Friday before a Select Committee of the House of Commons, consisting of Sir Henry Fletcher (chairman), Mr. Strachey, Mr. Morris, and Mr. Tomkinson. The object of the Bill is "to empower the South Metropolitan Gas Company to raise additional capital; to purchase by agreement so much of the southern portion of the undertaking of the Gas Light and Coke Company as is situate in the County of London south of the Thames;" and to carry out other purposes.

The competing Bills of the Caledonian Electric Power Company and of the Clyde Valley Electrical Power Company, asking parliamentary sanction to provide electrical energy over extensive areas in the West of Scotland, and the petitions against the Bills of Govan, Greenock, and many other burghs whose areas these companies propose to invade, have, after ten days' hearing by a Select Committee of the House of Commons, been decided upon. The Caledonian Bill was rejected. The Clyde Valley was passed, but Port-Glasgow, Govan, Partick, Paisley, and Hamilton were struck out.

On Monday last the Select Committee of the House of Commons, presided over by Sir H. Fletcher, decided that the preamble of the Bill for transferring to the South Metropolitan Company the works of the Gas Light and Coke Company south of the Thames was proved, and suggested that the £900,000 to be paid to the latter company should be applied to the reduction of price to the consumers.

The hearing of the Mond Gas Bill was concluded last Monday by Colonel Welby's Select Committee of the House of Commons. In giving the decision of the Committee, the Chairman said the Committee considered, in addition to those points which had been promised by counsel for the promoters, they wished to make one more, which was that in the case of a new development of the gas, it must be certificated by the Board of Trade. Of the shares which had been allotted to Dr. Mond, 40,000 were to rank for dividend after other shareholders, and 35,000 after the holders of other shares had received 5 per cent. per annum. Subject to those conditions, he declared the preamble of the Bill passed, and ordered to be reported to the House for third reading.

The wonderful electric lighting effects in the great "Cinderella" pantomime at the London Hippodrome, which were carried out in such a successful manner on the "E. L. B." system, are now being repeated for various purposes in different parts of the country. Thus the entire Irish Section of the International Exhibition at Glasgow has been decorated by a scheme of garlands interspersed with shamrocks provided by the Electric Lighting Boards Company, of 7, Pall Mall. Again, we find a similar scheme of decorative illumination installed for the *café chantant* at the Crystal Palace, whilst the effects have also been used for decorative purposes on several occasions at the Grafton Galleries. The Hippodrome installation has, in fact, been quite a pioneer in the greater elaboration of electrical effects as now so easily obtainable on the "E. L. B." system.

In the House of Commons last week, the Omagh Gas Bill (Lords) came up for the second reading stage. Sir Walter Foster said he wished to see no step taken by the House which would prevent the Local Authority from acquiring under the Local Government Act powers of lighting on reasonable terms. Sir James Haslett, who supported the second reading, said the seconder of the rejection of the Bill (Mr. O'Doherty) had argued that if it were passed, the Local Authority would be deprived of the right of dealing with the property of the Gas Company, which was now to be put at a statutory value of £15,000, and the hon. member argued that if the property were left to an arbitrator to deal with he would pile up the value much more. The opponents of the Bill wanted to buy up the property of the Gas Company and assess it as it stood at present, and deal with it as a going concern. It was objected that the price of gas was now 5s. in Omagh, while it was only 3s. 6d. in Londonderry.

GENERAL.

The Durham City Council has decided to construct an underground lavatory.

The Northumberland County Council has decided to erect an isolation hospital at a cost of £1000.

The London County Council has agreed to lend the Woolwich Borough Council £2170 for the erection of a library.

The Nottingham Board of Guardians has decided to purchase a Green's steam economiser for the boilers at the new workhouse, at a cost of £800.

There was considerable activity in well-sinking in the Punjab during the past year, the total of 10,945 new wells being probably the largest on record.

The public baths in Balaam-street, Plaistow, were opened by the Mayor of West Ham on Saturday week. The buildings, exclusive of furnishing, cost £22,308.

The Liverpool Tramways Committee has decided to apply to the Board of Trade for sanction to borrow £319,000 for the purpose of carrying out the works authorised by the Liverpool Corporation Tramways Extension Orders, 1898 and 1900.

The tender of Messrs. Meldrum Bros., Limited, for their "Simplex" destructor and power plant to be erected at the pumping station, Sheerness, has been accepted.

The Local Government Board has sanctioned the necessary loan for the erection of an eight-cell Meldrum "Simplex" destructor and power plant at Walker-on-Tyne.

The Keighley and District Hospital has been presented with a thousand guineas by the daughters of the late Mr. R. L. Hattersley, Springfield, Keighley, in memory of their father.

The Middlesbrough Sanitary Committee has decided to appoint a female Inspector, part of whose duties will be to visit the poorer parts of the town and instruct parents as to the treatment of children.

At a meeting of the Loughborough Town Council, it was decided to make an application to the Local Government Board for sanction to a loan for the purpose of street works and the erection of a sanitary depôt.

A Local Government Board inquiry has been held at Market Harborough into the Urban District Council's application for a loan of £3050, to make a proposed new street from Fairfield-road to High-street.

The Bexhill Urban District Council has just taken a lease of Egerton Park, of fifteen acres, close to the seashore, which will be named Victoria Park, as a memorial to the late Queen, and thrown open to the public.

The inauguration of an electric enterprise of great importance to the county of Durham took place at Gateshead last week, when the combined new electric tramway and electric power services in that town were formally opened.

Last Monday, while a workman was clearing out a drain in Scotland-street, Glasgow, he was overcome by gas fumes, and a carter who went down to his rescue also became unconscious. Two workmen, who were passing, attempted a rescue, and brought the carter to the surface. The first man who was overcome by the fumes was, however, found to be dead.

We learn that considerable uneasiness is being felt in Belfast owing to an outbreak of small-pox which has taken place in the Oldpark district. During the past few weeks four patients, including two soldiers, have been treated in hospital, one case having terminated fatally. Two persons suspected of having contracted the disease have this week been removed to the isolation ward of the hospital.

The Board of Trade has recently confirmed Light Railway Orders authorising:—(1) The construction of light railways from Ravensthorpe to Cleckheaton, in the West Riding of the county of York; (2) the construction of light railways in the borough of Dewsbury, the urban districts of Cleckheaton, Liversedge, Heckmondwike, Gomersal, Birkenshaw, Hunsworth, and Thornhill, and (under certain conditions) in the city of Bradford and the borough of Batley, in the West Riding of the county of York; and (3) the construction of a light railway in the county of Warwick, in the urban district of Nuneaton and Chilvers Coton and the rural district of Atherstone.

A House of Commons Committee, presided over by Mr. Bill, has this week passed a measure introduced by the Corporation of Brighton, which contains some extremely interesting provisions. In the first place, it authorises the sale by the Brighton Aquarium Company to the Corporation of the whole of the company's undertaking for the sum of £30,000, and empowers the Corporation to construct and carry on a winter garden, pavilions, concert rooms, &c., as well as a school of marine biology, in connection with the Aquarium. Further, it empowers the Corporation to make a roof over the Aquarium, to be available as a promenade, and to admit the public thereto free of charge, and also to advertise the attractions of the Aquarium. Another provision of the Bill inflicts a penalty of 40s. on any manufacturer or dealer in "ice-cream, hokey-pokey, or other similar commodity" who permits such commodity to be sold or stored in any cellar or room in which there is an opening to a drain, or who, in the manufacture, sale, or storage of ice-cream, &c., does anything likely to expose it to infection or contamination. It is also provided that the Corporation shall keep a register of makers and dealers in ice-cream, &c., and that any unregistered person who deals in it within the borough renders himself liable to a penalty of £5 and a daily penalty of 40s.

The West Ham Corporation has in hand a scheme for erecting workmen's dwellings (double tenement) on the Manor-road and Temple Mills estates, which are estimated to cost £133,296. The rentals for the double tenements will range between 12s. and 12s. 9d. per week, and the houses will be fitted with all modern conveniences, including electric light.

Lord Overtoun, convener of the County of Dumbarton, opened last week the new joint hospital erected by the Western District Committee of the County Council of Dumbarton and Dumbarton Town Council. The hospital is situated on five acres of ground on the Cardross-road at Havock, which the two Authorities purchased for the purpose. It was estimated to cost about £14,000, but this sum is likely to be exceeded. The architect is Mr. J. M. Crawford, Dumbarton, and his plans were approved by the Local Government Board. The hospital contains six different buildings, consisting of administrative block, three pavilions of two wards each, caretaker's lodge, and other necessary buildings. The sewage will be treated by the septic tank system, which destroys all offensive and infectious matter. The whole of the buildings have been completed and furnished in the most scientific and up-to-date manner.

Mr. R. H. Bicknell, M.I.C.E., one of the Local Government Board's Inspectors, held an inquiry at Ilkley last Thursday into an application by the District Council for power to borrow money to reconstruct the bridges and culverts destroyed by the flood of last July. The expenditure which will be involved is estimated at £3550, but the Council also submitted for approval plans of a steel girder bridge, to be erected at the entrance to Heber's Ghyll, as an alternative scheme to the erection of a stone bridge, as recommended by their engineer, and it was calculated that a steel bridge will involve the expenditure of an additional £200. The Council decided to communicate with the Local Government Board in the course of a few days as to the scheme it wishes to submit for approval. There was no opposition. Mr. Frank Hall (Clerk to the Council), in his evidence in support of the application, stated that £7900 would cover all expenditure in repairing the damage caused by the flood. This sum was originally estimated.

The Middlesbrough Corporation having adopted its scheme of barging refuse out to sea stands in some danger of coming into conflict with the Redcar Urban District Council, if what the Inspector reported to the Sanitary Committee of that Authority is correct. He has reported that some time ago a quantity of refuse was washed up on the sands owing to the very high tides which prevailed about the time, and that the refuse was undoubtedly that which had been taken out to sea by the Middlesbrough Corporation. This is a serious state of affairs, and not to be tolerated if it is proved true. Redcar is a fashionable seaside resort, which is becoming more and more popular every year with people from the Midlands and the North of England, and the sands are the glory of the place. They afford a splendid recreation ground for the children, but if they once become the deposit bed of rubbish of the nature which is taken out to sea from Middlesbrough, then a serious injury is certain to be inflicted on Redcar.

Dr. E. Gwynn, Medical Officer of Health for Hampstead, has presented a report to the Hampstead Borough Council, urging in the strongest terms the necessity for making a collection of dust and house refuse twice a week during the summer months instead of once a week. He states that there are 152 blocks of flats in the borough, in which the refuse is generally stored in the well-like court-yard. The effluvium rises from the refuse and passes into the bedrooms. From all hospitals, institutions, and schools the refuse should be removed frequently. A short time ago a case came under his notice of a large school, in which an outbreak of diphtheria occurred, where the dust-bin was in the proximity of the children's playground. He appends to the report a list of flats, tenement and registered houses, and public institutions, numbering 2970, from which he considered that a collection should be made twice a week, and expresses the opinion that it would be well for the Council to go a step further, and consider the advisability of undertaking a twice-a-week collection for the whole borough—a question which will have to be considered in the near future.

The London and North-Western Company has ballasted the whole of its main line from London to Carlisle with clean granite chippings, which contain not a particle of dust; and it is stated that in consequence the traveller from London to Scotland, or *vice versâ*, may now leave windows and ventilators wide open, and enjoy the blessings of fresh air with no greater risk of annoyance from dust than if he were crossing a grass meadow. This is good, but there are other evils than dust met with in railway travelling. Cannot the London and South-Western do something to shut out the vile smells its travellers experience when passing between Earlsfield and Wimbledon?

The Lord Lieutenant of Ireland, speaking in Dublin on Saturday at a meeting of the local branch of the National Association for the Prevention of Tuberculosis, said he was gratified to hear that this disease could be treated successfully in Ireland. The condition of the tenement houses in Dublin, and the overcrowding of dwellings, rendered it extremely difficult for the people to obtain the fresh air which was so necessary for the cure of the disease, and he believed the present condition of sanitation in Dublin and Ireland required the gravest consideration. He hoped that the Congress to be held in London under the presidency of the King would be attended by the leaders of scientific thought in Ireland, and that its results would spread across the Channel and help to promote the health of Dublin.

PERSONAL.

Mr. F. E. Farrington, of Anston, near Sheffield, has been appointed Surveyor for Arundel.

Mr. Peirce, the Muncipal Engineer of Penang, has been appointed Municipal Engineer of Singapore.

Dr. Killam Roberts has been reappointed Medical Officer of Health for the rural district of Amptbill.

Dr. Gardner has been reappointed Medical Officer of Health for Kirbymoorside for the next three years.

Mr. Chas. T. Bacon, of Harlesden, has been appointed Sanitary Inspector to the Islington Borough Council.

The salary of Mr. Cook, Inspector of Meat, Fruit, Cowsheds, &c., has been increased from £200 to £225 per annum.

The Local Government Board has approved the appointment of Dr. T. Bamford as Medical Officer of Health for Uttoxeter.

Mr. H. E. Poole has been reappointed Surveyor and Sanitary Inspector for the urban district of Wath, at a salary of £150 per annum.

The Borough of Kensington has appointed Miss Grace Annie Looker as lady Sanitary Inspector at £110 a year. There were eleven applicants.

Dr. Charles Kelly has been reappointed Medical Officer of Health for the combined district of West Sussex for five years, subject to the sanction of the Local Government Board.

Mr. J. E. Harding, who for some time past has acted as Sanitary Inspector to the Hebburn District Council, has secured an appointment at Hetton-le-Hole as Surveyor and Inspector.

The Local Government Board has sanctioned the reappointment of Dr. M. A. Wood as Medical Officer of Health for the urban district of Ledbury, at a salary of £20 per annum.

Dr. Norman Moore has been elected the representative of the Royal College of Physicians of London in the General Medical Council of Education and Registration, in the place of Sir Dyce Duckworth, who has resigned.

We understand that Dr. F. J. Waldo, late Medical Officer of Health, St. George-the-Martyr, Southwark, is a candidate for the post of coroner to the City of London, vacant through the retirement of Mr. Langham. Combining as he does the joint qualifications of a medical man and a barrister-at-law, Dr. Waldo is essentially the man for the post. It will be remembered that Dr. Waldo was one of the selected candidates for the Medical Officership of the City, and was accorded a second place in the subsequent voting, but retired in favour of Dr. Collingridge.

NOTES AND QUERIES.

Subscribers may obtain advice on matters appertaining to Public Health Law and Municipal and Sanitary Engineering. Letters should be addressed "Notes and Queries," THE SANITARY RECORD, 5, Fetter-lane, London, E.C. If an answer be required immediately, a stamped addressed envelope must be enclosed

2193.—FACTORY AND WORKSHOP ACTS: MODEL BYE-LAWS.—"Surveyor" writes:—"(1) I shall be glad if you will inform me whether there is a second edition published of Davies and Yabbicom's useful little book 'Notes on the Factory and Workshop Acts,' price 4d. (2) Would you let me know what bye-laws are included in Handford and Mackenzie's 'Model Bye-laws'?"

Answer. (1) A second edition of the book referred to has not been published. (2) Handford and Mackenzie's "Model Bye-laws," two volumes, price 25s., contains practically the whole of the bye-laws and regulations which may be made by a Local Authority under the Public Health Acts. The list is too long to be reproduced here. The book may be obtained from the office of this journal post free at the published price.

2194.—FEMALE SANITARY INSPECTORSHIPS: HOW TO QUALIFY FOR.—"K. B." writes:—"Will you kindly advise me how I should qualify for the post of (woman) Sanitary Inspector, where I should train, what examination I should require to pass, and what books on the subject would be most useful?"

Answer.—The querist should obtain by examination the certificate of the Sanitary Institute for Sanitary Inspectors. She may obtain tuition by correspondence through the post from some one of the gentlemen who advertise in our pages to prepare candidates for the examination. The books recommended are Reid's "Practical Sanitation," price 6s.; Model Answers to Questions set at the Sanitary Institute Examinations, price 2s. 2d.; Chapman's "Student's Guide to Success in Sanitary Inspector's Examinations," price 1s. 8d.; Taylor's "Sanitary Inspector's Handbook," price 5s. Any of the books may be obtained from the office of this journal post free at the prices named.

2195.—FACTORY INSPECTORSHIP: EXAMINATION BOOKS.—"Constant Reader" writes:—"Would you kindly recommend me a list of books to study for the examination for Factory Inspectors?"

Answer.—The querist is advised to refer to our answers to query No. 994 in our issue of March 18th, 1898, and query No. 485 in our issue of May 26th, 1899, which give extended information as to the syllabus of subjects for the examinations and the procedure. The querist will find, we think, that no special books are required in preparing for the examination.

2196.—HOUSES WITHOUT SANITARY CONVENIENCES: PROCEDURE.—"W. E." writes:—"I made an application to the Petty Sessional Court recently for closing orders under Sec. 32 of the Housing of the Working Classes Act, 1890, in respect to some houses which were in a fair condition, but had no proper privy and ashpit. The magistrates refused to issue an order, contending that they were in a sanitary condition, and that there being no ashpit and privy did not constitute them insanitary. Are the magistrates, in your opinion, acting according to law in dismissing the cases? If so, will you please inform me under what Act should proceedings be taken in similar cases?"

Answer.—Upon the facts stated the magistrates were, in our opinion, justified in declining to issue a closing order in regard to the dwellings. The Local Authority are enabled by notice under Sec. 36 of the Public Health Act, 1875, to require the owner of the houses to provide a sufficient privy, or w.c., and an ashpit, and on his default in providing them, may do the work themselves, and recover the cost from him. The Local Authority should proceed under this section.

2197.—SALE OF FOOD AND DRUGS ACT, 1899: TAKING SAMPLE IN COURSE OF DELIVERY OR TRANSIT.—"H. C. G." writes:—"What is the proper procedure on taking samples of milk on delivery according to the Sale of Food and Drugs Act, 1899? There does not appear to be any provision for a third part in case of dispute. Section 22 seems to imply that such is not necessary, but that the production by the defendant of a certificate of analysis in the proper form from a public analyst would be accepted as evidence instead of the usual reference to Somerset House. I should be glad if you will let me know if this is the correct view. Also, is it necessary to first obtain the consent of the consignee before taking samples of milk on delivery, or does such consent have to be obtained only in the case of taking samples on delivery of other articles of food?"

Answer.—The provisions of Section 10 of the Sale of Food and Drugs Act, 1899, are in extension of Sec. 3 of the Sale of Food and Drugs Act Amendment Act, 1879. In the earlier Act no provision was made for a portion of the sample to be sent to the consignor, but under Sec. 10 a portion must now be sent to him if his name and address appear on the can. There is no provision for a third part to be kept by the Inspector, but such may nevertheless be done as a matter of prudence. Sec. 22 of the Act of 1899 provides for a defendant obtaining an analysis and producing same in Court. This does not, however, remove the discretion of the justices to direct the sending of a sample to the Government Laboratory—see Sec. 21. It is not necessary to obtain the consent of the consignee before taking samples of milk on delivery.

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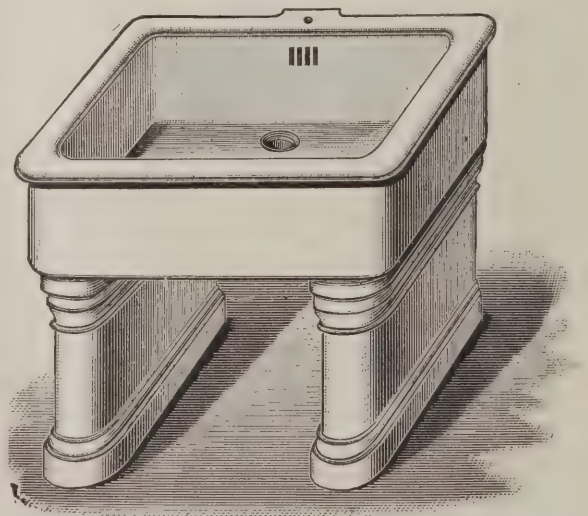

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THE PROGRESS IN PREVENTIVE MEDICINE.*

By Jas. T. Neech, L.R.C.P., D.P.H., Medical Officer of Health, Halifax.

Mr. President and Gentlemen,—I am afraid that I will not be able to present you with anything original this evening. But while original research and original investigation is absolutely necessary to the advancement of scientific medicine, yet sometimes the consideration of what is already known, the discussion, the criticism, the interchange of ideas upon what may be considered to be already established facts and principles, is calculated to broaden out and increase individual information, and promote a wider and more extended grasp of such subjects, and is, I think, equally necessary to secure true, reliable, and substantial progress in the theory and practice of our profession. It used to be said that the duty of a medical man was to cure disease, relieve pain, and prolong life. This definition I have no doubt pretty fully comprehended the scope of both our work and duty when it was enunciated; but to-day, in the light of modern progress, an addition must be made thereto, and it must read, "To prevent disease, to cure disease, to relieve pain, and prolong life," and undoubtedly it is preventive medicine which offers the widest field for future research and investigation and future progress.

The art of surgery has made great and rapid strides even within the recollection of many here present, so much so that only a comparatively small portion of the human body can now be held sacred and to be outside the reach of the surgeon's knife. It seems possible, therefore, that further advancement in surgery will partake more of the nature of improvements in methods and procedure. In medicine, too, there is no less marked advancement. Since the introduction of the microscope and the application of the more perfected methods of modern research the theory and practice of medicine has been completely modified. Some of the results of all this is that we have now a clearer idea and a more definite knowledge both regarding the nature and causes of diseased conditions generally. That so-called class of functional disease is being rapidly blotted out from our nomenclature. We now look upon unction as being the result of tissue change, or the occurrence of certain complex and complicated chemical, molecular, or other changes within the tissues, and I would further urge that the same specified function or act requires for its repetition the repetition of exactly the same or similar changes in the tissues. Hence it seems that alteration in function means a corresponding alteration in structure or in the quality of that sequence, or cycle of complex changes, of which function is the result. Also in the treatment of disease there has been a change. Drugs are not now looked upon as the active agents in the cure of disease such as they were in times gone by, and new systems and new methods have been adopted. Certain substances of an organic nature have been brought into requisition; for example, the thyroid extract in myxoedema and the various antitoxins for the treatment of the special disease for which each is applicable, and modern research in treatment is guiding itself in the direction of the latter method.

It is in preventive medicine, however, that perhaps the most marked progress has been made, especially during the closing years of the past century. There has been a vast quantity of invaluable statistics, vital and others, carefully compiled and tabulated from year to year, and the existence of such is very necessary to the advancement of public health. They frequently serve to point out to the investigator new paths of research, or direct his energies into those channels that are calculated to bring forth the most valuable results. Then, again, carefully and accurately compiled statistics, extending over a prolonged period, further serve to indicate the value or otherwise which new methods and new conditions, suggested by the advancement of scientific knowledge, and adopted and instituted from time to time, exert in the improvement of public health.

There has been a great deal of work done, and a large amount of information obtained, both with regard to the relation which the condition and surroundings of habitations bear to disease and the effects which occupation produce upon the health of those engaged in various manufacturing processes; with the result that there has been a marked improvement in the former, and in the latter improved methods have been enforced to minimise the danger.

Since the introduction of the germ theory and the acknowledged association of certain specific microbes with certain diseases in the relation of cause and effect, our ideas regarding the nature and propagation of zymotic diseases have completely changed. It is true that the specific microbe of several of the fevers have so far defied all the efforts that have been made to isolate them, at any rate with any degree of certainty, but that these diseases and others also are of microbic origin no one will now gainsay. Here, then, is a wide field for research, and one that is pregnant with possibilities, the attainment of which would be of the utmost value, because until each of these microbes has been discovered a ready method of detecting them made known, their life history worked out, and their possible relationship to other microbes, it seems to me that it will be impossible to decide when a person who has suffered from any of the infectious diseases becomes free from infection and is absolutely safe to mix with the public; and, further, it will be impossible to account for the origin of the many sporadic cases which crop up from time to time, and which appear at present to arise *de novo*. We do possess some little knowledge regarding the life-history of the typhoid microbe. It has been shown that it perishes when placed and is allowed to remain in virgin soil, but when it is placed in soil polluted with sewage, and to which additions of sewage matter are made from time to time, it will live, and possibly multiply.

We, at present, include under the term "typhoid" or "enteric fever," cases of continued fever which vary very much in their course, duration, and the symptoms manifested, so much so that I do not feel at all certain that all these cases are initiated and brought about by the action of one specific microbe. Hence it seems to me very necessary that the typhoid microbe should be further studied in its relation to others, and possibly to some of the microbes normally found in the intestinal canal, and whether the latter cannot under certain conditions take on a virulent form even allied to the typhoid bacillus.

When a man commences the work of emptying privies and privy middens, who previously had been unaccustomed to do so, or even when a fresh man is engaged at our Goux Yard in removing and renewing the tubs, after a varying period he becomes ill, and more or less feverish. I have, however, never been called upon to treat such a case, and cannot give the exact symptoms. This disease is, however, I believe, pretty well known among ashpit men, and I have heard it called by them "muck fever." Whether it is typhoid or not I cannot say.

I have necessarily only indicated a few of the directions in which sanitary science has made progress. Great advancement has been made all round, but as great as is the latter, I am sure one may venture to say that it is only the foretaste, only the stepping-stone to the accomplishment of still greater successes in the future, for I think that preventive medicine, above all other

* A paper read before the Halifax Medical Society, March 12th.

branches thereof, offers a far wider field for investigation and research, and holds in store vaster possibilities, the achievement of which will confer the greatest benefits, and bestow the greatest blessings upon humanity at large. In the prevention of zymotic diseases perhaps during recent years the line of investigation has been more definitely directed towards the discovery of methods for conferring the condition of immunity upon the individual. Just as certain persons are particularly prone to certain diseases, others enjoy a natural immunity. This, together with the fact that one attack confers upon the individual more or less freedom from future attacks, and the value of vaccination in the prevention of small-pox, which experience has shown, all naturally point to the possibility that some day we may be able to discover methods of conferring a condition of immunity in many other diseases.

A great many different theories have been put forward from time to time to explain the nature of immunity, but I imagine that it is due to no one thing or state of body, and that several factors co-operate in producing the condition. A few years ago the theory was enunciated that the white blood cells were the cause of immunity, and that they, and possibly also other cells of the body, play their part in producing the condition, cannot, I think, be denied, for the white blood cells have been observed to seize and destroy micro-organisms. Others, again, have urged that the fluids of the body have the power of destroying microbes, and there may be some truth in this also. But perhaps the more recent idea is that immunity is a vital act, that it is essentially due to the quality or condition or power, natural or acquired, of the vital activity of the tissue cells. Whatever life may be in its nature and its essence, it is at any rate a dynamic form of energy, and as such requires for its maintenance a constant tissue change, or a constant chemical, molecular, or other change within the tissues of an assimilative and dissimilative character; and doubtless there may be variation either in quality, intensity, or some other way in the character of these changes even in health, but if they are unduly interfered with there must be deviation from the condition of health. Now it is not merely in the presence of a pathogenic bacterium within the blood stream, or in any tissue specially liable to be attacked thereby, that danger lies, but in the poisonous substances given off or excreted as a result of the vital activities of these organisms, which, circulating in the blood, interfere with tissue change and vital action. I regard an attack of infectious disease somewhat in the light of the principle of the survival of the fittest, for in it you have life pitted against life, the vitality of the invading organisms pitted against the vitality of the tissue cells of their host, and the ultimate result seems to me to depend to a great extent upon the tenacity and duration with which the latter can resist the former and are able to carry out and perform their vital functions. After the attack is over the patient enjoys more or less immunity from the disease, because the tissues have become accustomed during the previous attack to the presence of certain toxines in the fluids from which they derive their nourishment, and have acquired the power of taking up nutriment and performing their function even in the presence of the poisons. It is a law in nature that an organism, at any rate within certain limits, can adapt itself to surrounding conditions. When the germs or microbes of a specific fever infect a subject who is immune thereto, the toxines they give off produce little or no deleterious effect upon the vital activity of his tissues, hence time and opportunity are given to the white blood corpuscles and possibly other cells to destroy them, and perhaps the emunctory organs to excrete them.

The term immunity is a relative one. There are degrees of immunity. There are individuals in whom a certain dose of a given poison would produce no effect, but give a larger dose or one more virulent in nature, and results follow characteristic of the particular disease. Also even in some mild cases of fever it seems possible for the patient to be re-infected with a fresh dose of the poison, or with one somewhat more virulent, and a relapse occurs. This I have several times seen in scarlet fever. Occasionally one sees a mild case of this fever brought into the wards with the characteristic rash and other symptoms; the disease runs its usual course and the temperature falls. But after the patient has been in hospital eight or ten days there is, perhaps, vomiting, the throat again becomes sore, the temperature goes up, and the rash re-appears; so that you have the rash out and desquamation going on at the same time—a distinct relapse. As far as I am aware, this is never seen in private practice—at any rate, I was not aware that it could happen until some time after I had charge of scarlet-fever wards.

Pigeons, hens, dogs, and frogs are immune to anthrax, but deprive pigeons of food, and they lose their immunity. The same thing occurs in the case of pigeons, hens, and dogs if they be deprived of water. Expose hens to cold to a sufficient extent to depress their temperature, and they lose their immunity to anthrax. Expose a frog to heat so that its temperature is raised, and it loses its immunity thereto also. Rats when fatigued are more liable to bacterial infection, and also animals bled to the extent of bringing on hydræmia. All these conditions interfere with nutrition and depress vitality, and, consequently, do they not point to the conclusion that immunity is largely and essentially a vital process?

It has been shown that immunity from certain diseases can be conferred upon animals and individuals, and I think there is no doubt but that the number of diseases in which it will be possible to do this will be increased in the future. It has also been shown that, under certain conditions, even natural immunity can be temporarily interfered with and its power suspended. It seems to me, therefore, not unreasonable to suppose that the converse may also be true, and that it may not be outside the bounds of possibility not only to establish a more or less permanent immunity in an increased number of diseases, but also to discover means whereby temporary immunity could be secured, and that such methods, under certain conditions, might be of great practical value.

COFFEE AS A DISINFECTANT.

The use of coffee as a disinfectant is generally known, but it is doubtful if the majority of people are aware of its true value in this direction. They probably know that it is handy and harmless, but besides possessing these qualities it is really one of the most powerful and effective agents known, as has been shown by repeated experiments. In one case a quantity of meat was placed in a close room and allowed to decompose. A chafing dish was then introduced and 500 grammes of coffee were thrown on the fire. In a few minutes the room had been entirely disinfected. In another room the fumes of sulphuretted hydrogen and ammonia were developed, and the smell—which no words can express—was destroyed in half a minute by the use of ninety grammes of coffee. As a proof that the noxious smells are really decomposed, and not merely overpowered by the fumes of coffee, it is stated that the first vapours of the coffee are not smelled at all, and are, therefore, chemically absorbed, while the other smells gradually diminish as the fumigation continues. The merest "pinch" of coffee is usually sufficient to cleanse a sick-room, even in aggravated cases. The best way to employ it is to freshly pound the coffee in a mortar, if no mill is at hand, and sprinkle it on a red-hot iron surface.—*Health.*

NUISANCES AND METHODS OF INSPECTION.[1]

By J. Spottiswoode Cameron, M.B., B.Sc., M.O.H. Leeds.

NUISANCES AND INSANITARY CONDITIONS.

(*Continued from page 426.*)

The amount of sunlight in the bedroom is an important factor in its healthiness. The windows should, therefore, be large. They should be capable of being opened. The nursery, if there be one, should be airy, and have plenty of sunlight. Fig. 14 shows the ordinary form of inspection chamber with trap.

Where there is no sewer, the house wastes may have to pass into a cesspool. The question of the dumb cesspool has again come into prominence through the abours of my namesake at Exeter. The dumb cess-

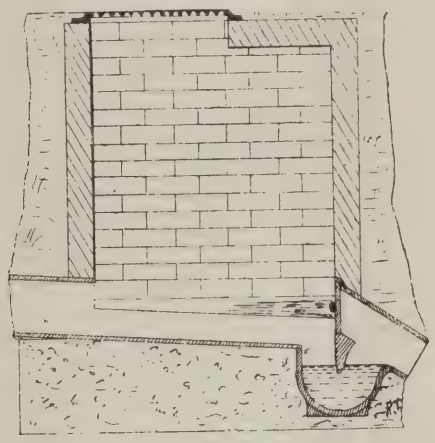


Fig. 14

pool is practically an intercepting tank, and the reason why it sometimes contains so little deposit is explained by the action of the anaërobic bacteria. They act best in the dark, and deprived of air. A cesspool on this type must be trapped at its inlet and its outlet, and it is better that the drain going to it should run for a short distance under a grate or in the open air. The effluent from the cesspool may be carried to the land, or to aërobic bacteria tanks, which should not discharge near to a dwelling-house or footway.

The yard should contain no pigstyes, hen-coops, or other nuisances near the house, and should be paved with a smooth, impervious material. The best form of ash-pit is a galvanised iron tub standing under a small pent-house. Dr. Quine's arrangement is, on the whole, a satisfactory one. We have tried it in ten cottages built by the Corporation, with good results. Where it is constructed without a cover, it is less satisfactory.

Where there is an inspection chamber (Fig. 14) and an intercepting trap it is possible to test the drains either by the smoke or water method. The simplest smoke process consists in putting one or two of Payne's rockets a few inches up the drain; and closing the end of the pipe with one of Addison's or Jones's plugs. One of the smoke producing machines may be used for the same purpose, connecting the tube of the machine with the tap provided for that purpose in the plug. The smoke should be allowed to continue till it is seen to escape from the ventilating pipe.

This should then be stopped and the process allowed to go on a little longer. It is almost necessary to have an assistant either to attend to this or to make a search for the smoke inside the house. This test, or the smell test already spoken of, has the advantage that the smoke or the smell will penetrate through leaky pipes within the dwelling. The water test is more satisfactory from a purely engineering point of view as it tests the outside drains their whole length to the inspection chamber. The plug having been inserted at the latter, the drains are filled with water up to the level of the surface of the lowest trap in or round the building. The level of the water at the surface is then noted and any fall observed. This is most conveniently done where there is a pipe without a trap, but, if the water in the trap be raised some inches above the water seal, any fall can be observed. If there is no fall it may be taken for granted that the pipes do not leak, but neither this test nor either of the others mentioned indicates absolutely whether or not the pipes are properly laid. If, however, a large quantity of foul matter escapes when the plug is withdrawn, it is probable that the drain, although tight, is badly laid. Had the drains been recently flushed there might be no indication of this kind.

On the whole the smoke test is fairly convenient, and its results when positive are of considerable value. The form I prefer, although it is a little inconvenient to carry, is the boxwood float with a spring. The spring is fastened down by a catch to which is attached a string. A small sealed glass tube containing calcium phosphide is inserted above the spring into two little wire loops. The string is wound round the ball, which is placed under the seal of the trap, and allowed to float on the water outside. The cistern is then discharged, or a pailful of water sent suddenly down the trap. The ball is carried over the nose beyond, and into the drain. The catch on the spring is loosened by the tension of the string. The powder is spread over the moist surface of the drain or soil-pipe and hydrogen phosphide liberated. This gas is very penetrating and easily recognised by its smell. Unfortunately it is somewhat poisonous.

The form of this test in the double tie tube is the one in more frequent use, chiefly on account of greater portability. There is a greater risk of some of the

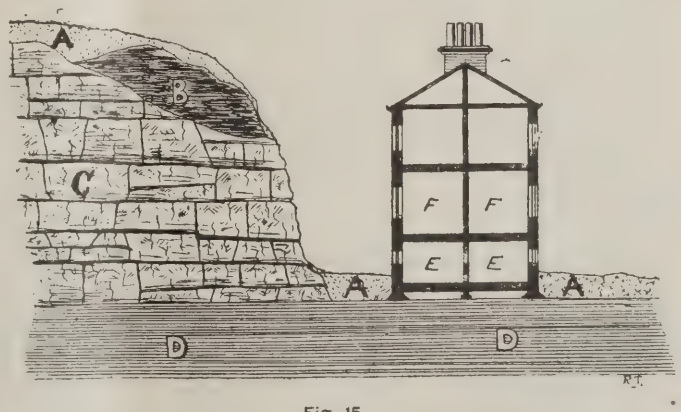


Fig. 15

powder getting loose and causing a smell the wrong side of the trap. Mr. Hammond has invented an ingenious variant of the method.

The closeness of surrounding properties interfering with light and air—the neighbourhood of pigstyes, privies, and other nuisances on adjoining properties—must all be observed in examining the outside of the house. The condition of the brickwork and of the roof,

[1] A lecture delivered in the Philosophical Hall, Leeds, April 13th, 1901. The illustrations to this lecture are from Dr. J. Spottiswoode Cameron's little work, entitled "Is my House Healthy?" published by Mr. R. Jackson, Leeds, and are reproduced in these columns by special permission

the situation of stacks of ventilating pipes in their relation to windows and chimneys (Fig. 13) will all be observed. The aspect of the house and the nature of the site must also be noted. A terrace of through houses is best placed when it runs north and south, as direct sunshine can, in that case, enter each side of the house at some portion of the day. A row of back-to-back houses, with similar bearings, will get the sun in fine weather either morning or evening on each house. A row of back-to-back houses running east and west will have the sun upon the south side, but only during a very small portion of the dog-days any upon the houses facing north, and what does reach them will do so very obliquely.

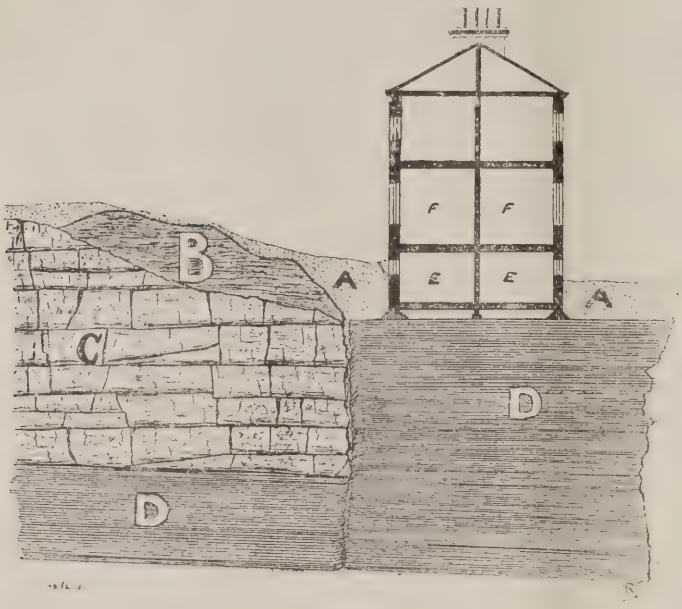


Fig. 16

I close with three slides showing how a house built in the neighbourhood of a geological fault may easily be damp. The first slide (Fig. 15) represents a house against a hill-side, evidently damp from the moisture exhaled from the rock behind, and from that which, percolating into the porous soil on which the house is built, is prevented from getting away by the denser stratum D below.

The next diagram shows the same house on the up-throw of a fault. The water falling on the hills behind, penetrating the porous strata C, rises along the line of the fault. The remaining diagram shows a house upon the down-throw of a fault, also made deep in a somewhat similar manner.

Finally, in your examination of a house, be systematic, be thorough, note down your findings at the time, and read through your notes before leaving the premises to make sure that you have left no part of the inspection half completed.

We find it convenient in Leeds to classify our house examinations under six groups. In three of these groups the examination is required to be complete of the whole premises from top to bottom, and these complete examinations are made (1) on account of the existence of infectious disease; (2) in consequence of complaint; (3) in pursuance of house-to-house work. It is obvious that if your house-to-house work is well in advance, the examinations under (1) and (2) can be made much more rapidly.

We have, however, three other groups of house inspections in which, generally on account of complaint made, and in order not to interfere with the more systematic examination house-to-house, the Inspector is permitted to make what is called a "partial examination." This may concern (4) the occupants. In this case he fills up house-to-house queries Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, and 14. As this partial examination is generally in consequence of overcrowding, he is expected to give the dimensions of each room and the number and ages of its nightly occupants. Another partial examination may refer to (5) buildings and offices. In this case we expect house-to-house queries Nos. 1, 2, 3, 4, 5, 6, 7, 8, 11, 12, 13, 14, 15, 26, 27, 28, 29, 30 filled up, and any other necessary information given. Stress would, of course, be laid on the dryness of the house, the adequacy of the ventilation and the sufficiency of the closet accommodation Another partial examination permitted occasionally refers (6) to drainage. The queries to which answers must be given in every case are Nos. 1, 2, 3, 4, 5, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 30, and 32, along with any similar information. The drains should in this case be tested. These three partial examinations are expected to be, as far as they go, as systematic and complete as the whole house examinations described, but it is obviously preferable to make the examination complete at first.

So far I have spent much time in describing the examination of a house. I have not so much attempted to describe each particular fault, which might be found in a dwelling, as to indicate the methods which should be employed. While the house is the unit, and while it is desirable that every house in your district should be examined as completely and in some such method as that described, it is obvious that there must be, in addition, a more rapid inspection of the whole district for more obvious nuisances. It is well to map out your district, say, into five divisions, and to spend a

Fig. 17

portion of one day each week perambulating this division, spending, if possible, another portion of at least four days in the week in following up from house to house the complete examination of dwellings and their surroundings in a smaller portion of one of the larger divisions. In this way you will be able to carry out, at one and the same time, what one might distinguish as a cursory and a minute description of your district. Last, and perhaps really least in real importance, is the examination where complaint has been made. This cannot, of course, be neglected, and it is better where, say, illness is suspected to be due to insanitary conditions to let your examination of the house be on lines as complete as those I have already described.

It is not part of my subject to deal with the methods of abating nuisances. It is, however, part even of the Assistant Inspector's duty to ascertain that the required work has been carried out, and in the weekly perambulation of his district he should, of course, note what has been done and what has been left undone. If he be an Assistant Inspector he should keep himself informed as to when the notice went out and what period of time is allowed for its completion, and should report to his superior officer as soon as that time has expired. For this purpose it would be well if he were to enter in his diary beforehand the dates when such notices run out, and should make it in his way to visit as soon after that date as it is practicable. In this manner, as in the examination of the house itself, much time will be saved by a man who is systematic.

System, method, and tact will ensure in the examination of a house that the Inspector leaves no possible source of nuisance unquestioned, that in the examination of his district no obvious nuisance, such as the stoppage of street gullies, or accumulation of filth, is overlooked, and that the works which have been ordered at his instance are properly carried out. System, method, and tact, with a respectable knowledge of his work, are the essential qualities of a good Sanitary Inspector.

SANITARY WORK WITHIN THE ARMY.

By "Justice."

The history of sanitary work within the army is full of interest, as showing how a highly important element in army life, and of supreme importance to the well-being of the soldier serving England under very trying conditions over a wide-scattered empire, can be killed out and rendered useless by official prejudice or culpable neglect.

Up to 1855, the Crimean epoch, the prevention as opposed to the cure of disease formed no official part of the duties of the Army Medical Service.

Generation after generation of distinguished military surgeons had pointed out the need of studying this vital branch of army medical economy, but they were simply voices crying in the wilderness, and had no official authority to speak or to write one single word on these vital matters.

The soldiery died in a deplorable way from purely preventable disease, caused by easily removable conditions; and the theory of military officialdom was—doctors are very good in their place, but that place is the curing of the sick in the hospitals.

After the disasters of the Crimean campaign, and the great wakening up of the nation to the defects of its military system, a real step forward was taken in installing sanitary science as a factor in military efficiency. Sanitary rules were laid down, the surroundings of the soldier as to cubic space greatly improved, and a special sub-department formed in the Army Medical Department to act as an advisory and recording office on all army health matters.

The further to secure a supply of trained sanitary officials, the great Edmund Parkes was made Professor of Military Hygiene at the newly established Army Medical School, and with an assistant professor he organised the Netley teaching in hygiene, and the foundation of the Public Health Laboratory at Netley took place in due course.

A special order was issued by the War-office, conferring on Medical Officers the right and the duty of making sanitary recommendations to military commanding officers, and as a result in the succeeding years a real improvement took place in the sanitary condition of the soldiers. A succession of experienced and able officers of standing held the office of Sanitary Chief of the sub-department of the Army Medical Office and their reports in the annual Blue-books of the Army Medical Department were of real value, full of instructions to the officers, and with practical results to the men.

In carrying out their sanitary duties the Medical Officers constantly incurred great opposition and ignorant obstruction from those who knew nothing of their aims, and in many cases incurred great risk of personal ruin in the service for outspokenness in this important work.

The whole aim of the reactionary and more ignorant portion of the military officers was at all costs to kill out the sanitary initiative of the medical service, to drive these officers entirely to the care in hospital of men who should never have been sick, and at all costs to prevent the medical service in any way standing up for the soldiers' rights, in food, lodgment, or sanitary surroundings.

It was evident to them that whatever drew into the army medical service, an ignorant, idle, indifferently trained body of Medical Officers would in the end surely weaken the sanitary initiative of the medical service; and the parrot cry of "good doctors" in the curative sense, as opposed to far-seeing sanitary officials, became the watchword of a party in the army.

From the time of the necessary unification of the medical service, carried out in 1873, the whole of the feeling that that reform introduced into the army was made use of to crush out sanitary work.

By the abolition of the statistical branch of the medical office in 1881, a blow was given to the guiding and thinking power of the army medical office, and immediately after Lord Wolseley attacked the sanitary work of the doctors in his "Field Service Manual" put himself forward as the standard-bearer of the anti-sanitary party in the military body, and finally, before Lord Camperdown's Committee on the medical service in 1889, proposed the complete abolition of the army medical school, and all the sanitary training of the officers it implied.

It may safely be said that a more injurious blow was never given to the army, and this, too, by one who posed as an advanced soldier.

As Adjutant-General and Commander-in-Chief he was then able to put in force all his anti-sanitary views, and scores of commanding generals and subordinate officers, influenced by his position, his known proclivities and aversions, followed blindly his dangerous lead.

With logical sequence Lord Wolseley abolished the sanitary officers laid down by the post-Crimean reformers in 1858 for the divisions and the army corps in war; and, presumably owing to his influence, an untrained and unspecialised major in the R.A.M.C. sat for ten years in the chair of the Sanitary Chief of the Medical Branch of the War-office. That this officer had been the personal doctor of Lord Wolseley in the Nile expedition of 1855 may have been a mere coincidence, but the coincidence is peculiar and striking.

It may safely be said that for all the ten years of this sanitary control a period of absolute stagnation occurred in military sanitation, and every suggestion put forward by the Medical Officers for the soldiers fell unheeded to the ground.

Under Director-Generals chosen by influences, which it is difficult to describe, the whole sanitary initiative of the English army under the control of the War-office was practically in abeyance, and the English army, which in the 'fifties set the lead in sanitary reform, is to-day probably the most retrograde in Europe in its crowded barracks, defective bathing accommodation, and the want of suitable and warm clothing and underwear for the soldier. With a medical administration thus weakened and a sanitary branch practically in abeyance, the South African war broke out, and an army was sent to South Africa absolutely without a sanitary staff. The principal Medical Officers of divisions, themselves overwhelmed with work, were supposed to carry out this duty; and the principal sanitary officer of the army—an officer specially appointed by the Sydney Herbert School of reformers in 1858—had no place in the expedition. It seemed a complete return to Crimean days.

The deaths from enteric that have resulted are as surely the logical outcome of the destructive action of Lord Wolseley and the reactionary party in the army, and a weak medical directorate, as anything can possibly be.

As contributory details in this matter of the general breakdown of the sanitary side of army work, it is to be noted that while principal Medical Officers of districts in former times made their inspections of their district twice each year; now they do it once only, and they are practically unable to personally see the result of their suggestions for improvements for a whole year after they are made. The monthly sanitary report of former years has now been reduced to a quarterly report, and so on in every detail of sanitary supervision.

The post of Chief of the Sanitary Branch of the Army Medical Office at the War-office is to-day held by a major of the medical corps, whose experience of the army and of the empire must be naturally limited by want of higher rank and service.

The Blue-book of the Army Medical Service, once a publication of real sanitary value, and formerly presented by the State to every Medical Officer annually, is now a meagre publication, and is no longer so individually bestowed.

The sanitary officership at Aldershot camp, once held by a Medical Officer of colonel's rank, is now abolished, and it would be difficult in any single large garrison to say who is the responsible Medical Officer of Health. The whole aim seems to be to drive the doctors into the military hospitals, to treat soldiers who should never have been ailing at all had better lodgment, feeding, education, and employment been available for them. Recruiting is greatly handicapped by the existence in barracks of defective sanitary surroundings for the soldier, such as could be in a year or two remedied, if any real desire existed for reforms. No body of officers in the army know this better than the doctors, but the constant statement is made by them that, however idle, careless, or ignorant they may be, promotion may still come; but speak one word for sanitary reform, their future career is doubtful, and an ominous silence follows on all sanitary matters.

In no branch of their duties have the Medical Officers suffered such oppression and such official despotism as in their sanitary work. The whole aim of ignorant or reactionary officers in the service has been to cow and break down the efforts of the Medical Officer in his sanitary duties. Just as an ignorant or interested Vestry or Board of Guardians may bully their Medical Officer if he shows sanitary initiative, so in the military service ignorant or incapable generals may resent all sanitary recommendations made for the good of the soldiers by the medical service; and the future career of the Medical Officer may be marred by confidential reports made against him for work done for the good of the soldier and the State. In no part of their duties do the Medical Officers need more protection than in their sanitary work, and in none do they receive less sympathy or support.

THE SEWAGE DISPOSAL WORKS AT OSWESTRY.*

By G. William Lacy, Borough Engineer and Surveyor, Oswestry.

The bacterial sewage disposal works were designed and partly carried out by the author's predecessor (Mr. R. O. Wynne Roberts) and completed under the supervision of the author in June, 1899. They have been constructed by direct employment of labour, and the cost has been met out of current revenue.

Prior to the construction of these beds the system of treatment was crude, the sewage simply running through two settling tanks and away. In 1895 Messrs. John Taylor, Sons, and Santo Crimp, civil engineers, submitted a report on the question recommending a scheme which, including the purchase and laying out of 51 acres of land and works for dealing with the sludge, was estimated to cost £15,000, but on account of the cost this was not entertained. In October, 1896, the author's predecessor submitted a report, and finally it was decided to commence an experiment on the lines carried out by Mr. Dibdin at Sutton. This, after several months' trial, proving a success, it was decided to carry out a complete scheme, and the present works were commenced.

There are nine primary beds, the surface area of each being 60ft. by 60ft., and nine secondary beds, each with a surface area of 60ft. by 50ft., and they are constructed partly in the natural ground, and partly by earthen embankments, which are 11ft. wide at the bottom and 2ft. 6in. wide at the top. In the secondary bed embankments clay puddle was put as a security against percolation. On the floors of the beds lines of 3in. diameter agricultural pipes, a yard apart, are laid connecting with brick channels, which terminate in a small brick chamber in each bed, with the exception of the central ones, where they connect with a channel around the valve chambers. From these brick chambers 9in. glazed pipes are laid to the valve chambers, for discharging the effluents. The beds are filled with cinders, which were riddled from an old and large accumulation of house refuse; the gauge of those in the primary beds being from $\frac{3}{8}$in. to $1\frac{1}{2}$in., though containing very little of the larger size, and in the secondary beds from $\frac{3}{8}$in. to 1in. The depth of the cinders is 4ft. 6in. in each series. In the centre of each series there are automatic valves, which were designed by Mr. Wynne Roberts, in conjunction with Mr. Henry Roberts, Water Inspector, worked by water pressure from the town mains, which distribute the sewage and primary effluent to the various beds in rotation, hold up the sewage, &c., in contact in the beds, and discharge the effluents in due course.

Since the completion of the beds, it has been found necessary to put in aëration pipes from the ends of the collecting channels to the surface, in order to facilitate the discharge and complete drainage of the contents of the beds, and this has had a beneficial effect.

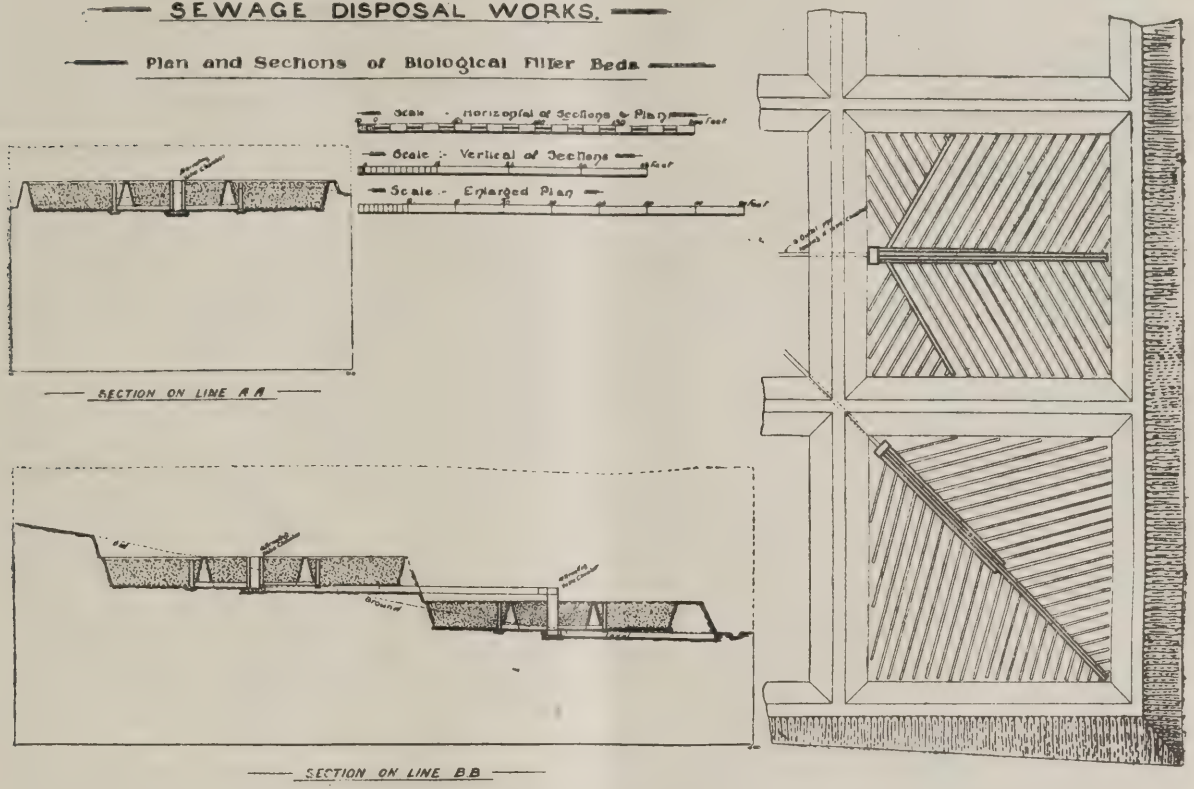
The primary beds have since the commencement of their full use been reduced in capacity by about 30 per cent., but no further decrease has been observed for some time; if anything, since the aëration pipes referred to have been fixed the capacity has increased, and certainly the results have been somewhat better

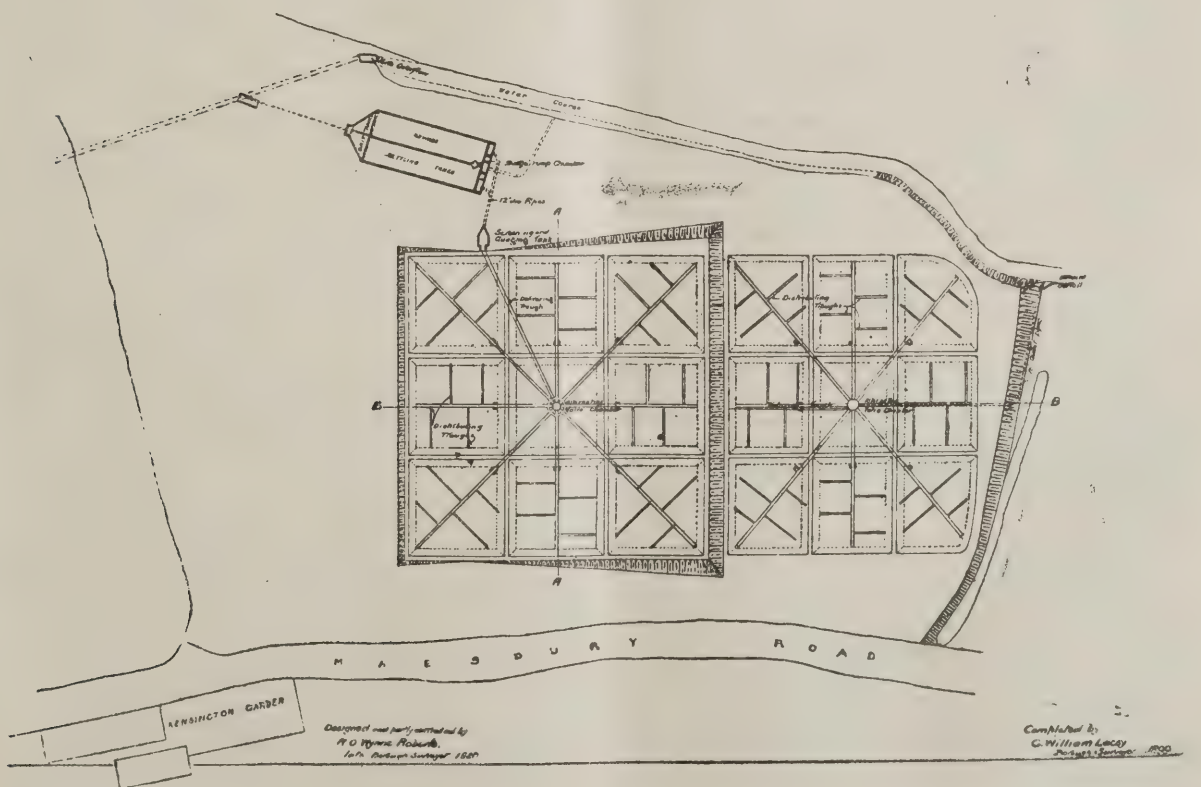
* From a paper on "Oswestry Municipal Work and Progress," read before the Incorporated Association of Municipal and County Engineers at Oswestry, May 18th, 1901.

BOROUGH OF OSWESTRY

SEWAGE DISPOSAL WORKS.

Plan and Sections of Biological Filter Beds





than before. No appreciable decrease has taken place in the capacity of the secondary beds.

The sewage first of all passes through one or both of the two settling tanks, 70ft. by 15ft. by 4ft. 6in., and in these a considerable quantity of sludge precipitates, no chemicals being used. The sewage and primary effluent are distributed over the beds by means of wood troughs, and the final effluent passes away through 12in. diameter pipes and discharges into a small water-course.

The sludge from the settling tanks is pumped out at intervals of from eight to ten weeks, mixed by machinery with fine screened ashes, and finds a ready sale to farmers at 6d. per load. It is not contended that this part of the process is ideal, or one which it is desirable to continue; but at the present time it serves to dispose of the large accumulation of screened ashes (the fine residue from the riddling), which otherwise would be more or less somewhat of a white, or rather, in this case, a black elephant. The author, some time ago, recommended his Sanitary Committee to consider the advisability of adding septic tanks, and in all probability this may eventually come to pass.

The quantity of sewage dealt with in the course of a year is about 160,000,000 gallons, the average daily flow in 1900 being 440,000 gallons, and the dry-weather flow 387,000. This includes a considerable quantity of spring or surface water which finds its way at some points into the sewers, as otherwise the dry-weather flow should not be more than 250,000 gallons per day. Notwithstanding this dilution the sewage, as the analyses show, is very strong, containing as it does a considerable proportion of brewery, tannery, and fellmongers' refuse.

The occasional analyses made of the effluent from the primary beds go to show that a remarkable proportion of the purification is effected by the first contact.

Samples of the effluents which have been kept for longer than a year show no signs whatever of putrescence, and analyses made during very severe winter weather showed but a slight diminution in the degree of purification. This diminution is but natural, as when the beds are partially covered with a sheet of frozen snow, the admission of air into the beds must of necessity be retarded; but this lessening of aëration is not likely to be of sufficient duration to materially affect the results. Records of temperatures taken during severe weather showed that not only the sewage, but the interior of the beds, both when full and empty, were several degrees above freezing point.

The cost of the construction of the bacteria beds and other work in connection therewith has been slightly over £2000, or equal to the sum of 4s. per head of population.

The net cost of maintenance at the present time, including sludge disposal, is about £225 per annum, or equal to 5¼d. per head of population. It is expected that this cost will be materially reduced ere long, as the automatic valves are being improved so as to render them more dependable, as up to the present it has been necessary to have a man on the works during the night.

As before stated, the cost of the construction of the works was defrayed out of revenue, but not the cost of the land acquired, and on June 2nd, 1899, a Local Government Board inquiry was held, sanction being sought to borrow the sum of £3500 to cover the above and other additional expenditure. This was not obtained, as our works did not allow for dealing altogether with six times the normal flow of sewage, and for after treatment of the effluent on land. This result, however, knowing the attitude of the Local Government Board on the subject, was no more than need have been expected.

INCORPORATED SOCIETY OF MEDICAL OFFICERS OF HEALTH.

METROPOLITAN BRANCH.

A MEETING of members of the Metropolitan Branch of the Incorporated Society of Medical Officers of Health was held on Friday at the Royal Statistical Society's rooms, Adelphi-terrace, W.C. Dr. F. J. Allan, president of the branch, occupied the chair, and there was a good attendance.

PLAGUE PRECAUTIONS.

A circular from the Public Health Committee of the London County Council respecting plague precautions was submitted, and considerable discussion took place as to its administrative aspects. It was held that sufficient arrangement for notifying borough Medical Officers of Health had not been made.

Dr. WINTER BLYTH, M.D., moved that representations be made to the Local Government Board on the subject, calling attention to the fact that present arrangements in regard to plague precautions in London did not provide for the borough Medical Officers of Health receiving early information from the London County Council as to suspected cases. He contended that in a matter of this importance to the community at large it was as needful for Medical Officers to receive this information at once as the Medical Officer's department of the London County Council.

Dr. F. J. SYKES seconded the motion, which was agreed to *nem. con.*, and the honorary secretary, Dr. O Field, was requested to take the necessary steps for laying the views of the Society before the Local Government Board.

SUPERVISION OF DRAINAGE WORK.

Dr. J. PRIESTLEY (Lambeth), in accordance with notice, drew attention to a circular letter recently sent to the metropolitan Borough Councils by the Royal Institute of British Architects on the subject of the inspection and supervision of drainage works, and moved:—"That, in the interests of efficient administration, all drainage work, whether of old or of new buildings, should be under one department of a Sanitary Authority, and that department should be the Sanitary Inspector's." He said that he regarded this question of the control and supervision of drainage works as very important in connection with the administration of the Borough Councils, and in support of this view he had collected some useful statistics which ought to be placed on record. It would be noted that the Royal Institute of British Architects went as far as possible in suggesting that the sanitary fittings and drainage arrangements of old and new buildings should be placed under the Surveyor's or Engineer's department. Reasons for this alteration were not given, but the outcome of such a drastic change would be a large increase in the staffs of the Surveyor's department, and a diminution of the inspectorial staffs, which were fully qualified to carry out this particular work. Sanitary Inspectors had a better knowledge of sanitary and drainage appliances than foremen and clerks of works, or assistants in the Surveyor's department. At least this was the case with metropolitan Inspectors, who had to pass a special examination to qualify them for their office. It therefore followed that the public health departments of the new Borough Council should have the control of all drainage work. In some cases in past years the drainage of new buildings was left to the Surveyor's department, and the drainage of old buildings with the sanitary staff. This caused dual control, and very often friction between the two departments. The sanitary arrangements in new buildings would be passed by the Surveyor's department, and sooner or later, if a case of infectious disease occurred, the Sanitary Inspectors would serve notices

for compliance with some drainage bye-law founded on modern principles. Thus owners of property would be put to much unnecessary trouble and expense. He thought it was desirable that the drainage of new buildings should be under the control of the officers who had the supervision of the drainage of old buildings. There were obvious advantages in consolidating the administrative work so far as sanitary arrangements were concerned under one set of officers. It was clear that the Medical Officer's department was better fitted in every way to deal with the drainage and sanitary fittings of all buildings. If the idea of the Royal Institute of British Architects was carried out, then the Sanitary Officers would have to supervise and test the work carried out by the Surveyor's department, the result of which would not always conduce to harmonious staff working. Besides, there would be involved a large increase in the Surveyor's staff, and this would be contrasted with the present tendency to increase the inspectorial staff of the Public Health departments. The Acts of Parliament dealing with drainage work as related to London left the control with the sanitary staffs, and any certificates were only given by the sanitary officers. The following statistics were important :—

Supervision and Control of House Drainage.

New building.	Old buildings.	
12	2	Under Surveyor's staff
16	23	Under Sanitary Inspectors
0	3	Under both Surveyor's staff and Sanitary Inspectors
2	2	Under Sanitary Inspectors acting under Surveyor
10	18	Sanitary Inspectors acting under Medical Officer
4	5	Sanitary Inspectors acting under both Surveyor and Medical Officer

Only two Borough Councils had arranged for the drains of both old and new buildings to be under the control and supervision of Surveyor's department, viz, Holborn and Kensington.

Drains of new buildings under supervision	..	Surveyor's staff ..	12
	..	Sanitary Inspectors	16
Drains of older buildings under supervision	..	Surveyor's staff ..	2
	..	SanitaryInspectors	26
Drains under supervision of Surveyor's staff	..	New buildings ..	12
	..	Old buildings	2
	..	New and old buildings	2
Drains under supervision of Sanitary Inspectors	..	New buildings ..	16
	..	Old buildings	26
	..	New and old buildings	16

Sanitary Inspectors Act in regard to drainage work under :

Surveyor alone	New buildings 2,	old buildings, 2
Medical Officer alone ..	,, 10,	,, 18
Both Surveyor and Medical Officer ..	,, 4,	,, 5

He regarded these statistics as of importance; they had been collected from the Borough Councils, and the object of the motion was to counteract the effect of the circular sent out by the Royal Institute of British Architects.

Dr. Sykes seconded the motion for the purposes of discussion, but said that he could not agree with it in its suggested form. It was impossible to keep engineers or surveyors entirely out of drainage work. In his district he had practical control. The motion was too sweeping, and he hoped it would be modified in some way.

Dr. Winter Blyth pointed out that the Surveyor's departments often had to open up drains for the sanitary staff and supervise the connections.

The Chairman asked what action had been taken on the circular. In the case of his Council at Westminster, it had been ordered to lie on the table. In that borough the Sanitary Inspectors were solely under him.

Dr. Priestley said that three Authorities—Holborn, Kensington, and Islington—had agreed with the circular; five had disagreed with it, viz., Bermondsey, Battersea, Woolwich, St. Pancras, and Shoreditch, while eighteen had decided to take no action; two Authorities—Wandsworth and Stoke Newington—had not yet sent in returns.

Dr. L. Parkes asked if it were wise to pass any resolution. Circumstances in the various boroughs widely differed, and a general rule was difficult of application.

After further discussion, it was resolved to modify the resolution to the following : "That in the opinion of this branch, all plans of drainage should be submitted to the Medical Officer and be signed by him before being submitted to the Surveyor," and in that form was agreed to with one dissentient. It was resolved that a copy of the resolution should be sent to the Medical Officers of Health of the various metropolitan Borough Councils.

BACTERIOLOGY OF VACCINIA.

Dr. R. A. Farrar, M.A., M.D., gave a valuable paper on "The Present Condition of our Knowledge of the Bacteriology of Variola and Vaccinia," and the speakers included Professor Dr. Tavel, of Berlin. A hearty vote of thanks was accorded to Dr. Farrar for his address.

PAISLEY'S NEW REFUSE DESTRUCTOR.

The new refuse destructor for Paisley, which has been erected by the Burgh Corporation at Underwood, was formally opened last week. Provost Wilson performed the opening ceremony, which was attended by a large number of representative gentlemen. Previous to formally opening the destructor the company were shown over the building, and the destructor was put in operation, so as to show the system followed in the destroying of the town's refuse. The Provost then declared the destructor open, after which the company adjourned to the large office attached to the works, where luncheon was served.

Provost Wilson, in opening the proceedings, referred at some length to the work of the Public Health Committee since that department took over the cleansing of the town twenty-five years ago. Formerly it had been the practice to dispose of the unsaleable portion of the town's refuse in public coups. That system, however, was not conducive to the health of the town, and so the Commissioners were brought face to face with the question of destroyng the refuse by fire, which was the surest and safest way of dealing with such rubbish from the public health point of view. But it took a number of years before the Council could be got to appreciate the necessity of getting rid of the refuse by burning, and it was not until April, 1898, that a Committee was appointed to inquire and report regarding these destructors. That Committee inspected many destructors in Scotland and England, and as the result of their investigations they recommended the adoption of the Horsfall system for Paisley—that which they had now inaugurated. The destructor had fully come up to their expectations. At present they were sending only about 60 tons per day to it; but he had it on reliable authority that it could easily dispose of 100 tons per day. There had been considerable agitation in the minds of the people regarding the alleged nuisance which the destructor would form in the district in which it had been erected; but now that the works had been seen in operation he thought every one would be satisfied that there had been no reason for such apprehension. There had been a good deal of expense in connection with the erection of the works, and it might be asked what they were going to get in return

for that expenditure. He would only answer that in destroying the refuse the destructor would have a powerful influence in increasing the cleanliness of the town, and it would doubtless also assist them in removing that blot which rested on Paisley of having the highest number of enteric fever cases of any of the principal towns of Scotland.

Councillor GLOVER, as convenor of the Public Health Committee, then gave some interesting particulars regarding the progress made within the past few years in the sanitary work of the town, and characterised the new destructor as one of the best investments they had yet made on behalf of the public health of the community.

Bailie BROWN afterwards proposed "The Contractors," which was acknowledged by Mr. G. WATSON and Mr. MORTON, and in their reply Mr. Watson presented the Provost with a silver tray as a memento of the occasion, and Mr. Morton presented Councillor Glover with a silver cigar case.

REVIEWS.

The Burials Act, 1900; *with Notes and Index*. By JAS. BROOKE LITTLE, B.A., Barrister-at-Law. Shaw and Sons. Price 7s. 6d.

THE editor of this little volume is a well-known authority on the law of burial, and the publication comes most timely. The Burial Act of 1900 has effected very important changes in the law, which require immediate attention from public Authorities. These changes, and the difficulties of construction in the new Act, are set forth and ably discussed in copious annotations. The Burial Act, 1900, we may observe, removes the obligation which was formerly incumbent upon Burial Boards to consecrate a portion of a cemetery, and also that which imposed upon them the duty of building a chapel upon a consecrated part of the cemetery. Every Burial Authority is now required by this Act to submit to the Secretary of State a table of fees to be received by them in respect of services rendered by any minister of religion or sexton, and such fees are to be recovered by the Burial Authority and paid over to the minister or sexton. Prior to the passing of the Act the Authority were under no obligation to collect such fees, and Nonconformist ministers had no statutory right to demand any fees whatever for performing a burial service in a burial ground. Now, however, he can recover his fee by action against the Burial Board. Sub-sections 4 and 5, of Section 3 of the Act, which provide for compensation to incumbents and sextons who had a right to "monumental fees," or fees for interments, will doubtless cause considerable controversy, and the copious notes of the editor will be found of great assistance. Section 7 of the Act removes the obligation of a Burial Authority to appoint a chaplain, but provides that existing chaplains cannot be removed, as the power of removal is given to the bishop alone, and Section 8 repeals the requirement of Section 1 of the Burial Laws Amendment Act, 1880, which required 48 hours' notice to be given of intention to bury in a burial ground. The schedule contains a list of enactments repealed by the Act of 1900. Included in the volume are the Public Health (Interments) Act, 1879, the Cemeteries Clauses Act, 1847, and the Local Government (Joint Committees) Act, 1897, as well as the Directions to Burial Authorities issued by the Secretary of State of the 1st January, 1901. Mr. Brooke Little has, in the editing of this volume, performed his work with scrupulous care, and his impartial and learned discussions on the interpretation to be placed upon the various sections will do much to remove the difficulties which are so usually attendant upon the coming into force of a new Act.

Quantities: Vol. I., Road-making and Sewer Construction for the Use of Surveyors, Municipal Engineers, and Architects, with various Tables, &c., for Ready Reference. By J. BARTLETT, M.S.A. The St. Bride's Press, Limited. 218 pp., 8vo. Price 7s. 6d.

THE author of this book, who is one of the examiners to the Society of Architects, demonstrator of building construction and architecture, King's College, London, and a lecturer on quantity surveying, informs us in his preface that the book has been written at the request of numerous students whom he has taught during the past twelve years, and to provide a concise and ready reference to the numerous items that occur in the practice of a municipal and county surveyor's office, and their method of measurement. There is no doubt that the book will be welcomed by young municipal engineers, as it supplies a want which had not been hitherto met, for although there are numerous books on quantities and quantity taking as regards builders' work, there was none published, so far as we are aware, with regard to road-making and sewer construction. The methods of "taking off," squaring, checking, "abstracting," and "billing," are explained, and tabulated details are given, showing their application to the work, and also as to the methods of measurement. The preparation of bills of quantities is also illustrated, and altogether with the aid of this book the inexperienced should be able to master the difficulties of getting out quantities in such a manner that they would bear the test of examination in cases of litigation. Specimen forms of tenders and specifications for the supply of materials are furnished, but no specifications of street works or sewerage works are given. The value of the book would have been greatly enhanced by their inclusion, but doubtless this will be remedied in a future edition. The book is clearly printed on good paper and bound in a neat cover.

National Health Society.

OFFICIAL TRANSACTIONS.

APPOINTMENT OF LADY SANITARY INSPECTOR.—We have great pleasure in recording the success of another of the Society's students in obtaining an appointment as Sanitary Inspector, Miss Grace Looker having been chosen from among eleven applicants as Sanitary Inspector in the borough of Kensington. Miss Looker is a diplomée of the Society, having taken the full training course both for the examination of the Sanitary Inspectors' Examination Board and for the diploma. We would draw the attention of our readers to the fact that this is the seventh public appointment which has been gained by the Society's students within the last few months.

ASSOCIATION OF NATIONAL HEALTH WORKERS.—A general meeting of the Association was held on Saturday, May 11th, at 53, Berners-street, attended by fifteen members, Dr. Childs in the chair. The Secretary reported that the Association now numbered forty-eight members. The finances of the Association were found to be in a most prosperous condition, there being a balance of £3 7s. 8d. in hand, with no prospective expenses till January, when the subscriptions are again due. December 30th was decided on as the date for the next bi-annual meeting, but the date is subject to alteration at the discretion of the Executive Committee. In view of the recent additions to the Executive Committee, a resolution was carried that the *personnel* of the Committee shall remain as it is until next May. The monthly "At Homes" are suspended for the present; members of the Association will be communicated with when they are recommenced.

MUNICIPAL ENGINEERING & SURVEYING.

CROSS-TABLE CHAT.

As I know of numerous surveyors who have sent in applications for the vacant appointment of Engineer to the municipality of Capetown, South Africa, it will be of general interest for me to state that six names have been selected by the London Agents of the Capetown municipality, viz., Messrs. S. E. Burgess, South Shields; W. Dyack, Aberdeen; A. Fidler, Southend-on-Sea; G. T. Lynam, Burton-on-Trent; J. Saunders, Chichester; and F. Wood, Bacup; and that the final selection will be made about the middle of June.

The Municipal Engineers' meeting which was held at Oswestry on Saturday last was an interesting and successful one, and appreciated by every member present, and Mr. Lacey, the courteous and popular Borough Surveyor, spared neither time nor trouble in achieving this result. The record of work carried out by him administratively is one which does him credit.

The extremely low cost of the construction of the bacteria beds, viz., £2000, for the efficient purification of the sewage of a population of 10,000, or 4s. per head, deserves especial notice, and is deserving of comparison with a scheme of land treatment submitted by Messrs. Taylor, Sons, and Santo Crimp in 1895, the estimate for which was £15,000. Similarly, too, the cost of treatment is abnormally low, viz., £225 per annum, or equal to 5¼d. per head of the population. I should like to hear of any district which can beat these figures.

The main secret of success in producing such low cost is, it should be known, to be attributed to the perversity of the Local Government Board, which refused to sanction a loan because there was no provision for the subsequent treatment of the effluents on land. The refusal of the Board, it often happens, is a blessing in disguise, as in the case of Oswestry, for the cost of the work, when defrayed from revenue, is considerably less than would otherwise be the case, and the results are equally as good, for the analyses which Mr. Lacey laid before the members, and which were made by himself, showed a remarkable degree of purification.

I am given to understand that a meeting of the Municipal and County Engineers' Association is to be held at Chichester, on Saturday, June 1st, when I have no doubt there will be a good muster of members. Chichester, I may point out, is one of the oldest cities in the kingdom, and its old city walls are still in existence, and utilised as promenades. The place is one of very considerable antiquarian interest; it has a population of 11,000, with a rateable value of £53,000, is a borough, and, like most old cities, possesses landed property, the rents from which are used in alleviation of the rates. Like most towns, too, it has its difficulties with regard to the disposal of its sewage, and the Council has recently been unpleasantly reminded thereof.

I would suggest to the Council of the Association that with a very slight amount of trouble they would be able to manifest consideration for the interest and convenience of members if they would deign to have arrangements made with the railway companies for the obtaining of tickets for members intending to travel from London at reduced fares. This neglect in the past has not been viewed by members generally as excusable, and might be atoned for by the exercise of a trifle more zeal than has been yet perceptible.

There has just been introduced into this country a new Automatic Fire Detector for use in buildings, ships, and collieries, which consists of a copper wire run round the rooms, generally near the ceiling. The wire has no break in it, and expands with heat, causing an attachment to drop which closes the circuit and electrically and instantaneously giving the alarm and indicating the exact position of the outbreak. It is not affected by seasonable variations in temperature, as is the case with some of the older forms of fusing media and thermometers, which had a tendency to go off under such conditions. The inventor is Mr. Chas. E. May, the Senior Mechanical Electrician to the Government of New Zealand, and in that colony it is in general use, and in connection with the fire brigade stations. The English company who are introducing it are the May-Oatway Fire Appliances, Limited, 53, New Broad-street, London, E.C., of which Sir Eyre M. Shaw, K.C.B., is chairman; Mr. G. H. Oatway the managing director; and Sir W. H. Preece, K.C.B., F.R.S., the consulting electrical engineer, the latter of whom advises that the system is reliable and thoroughly practical.

I adverted recently to the suggested bye-laws as to new buildings for rural districts which have been drafted by the Surveyors of the Chelmsford and Maldon Rural District Councils and to one or two of the proposed modifications from the Local Government Board's model bye-laws. Other alterations, in addition to those previously mentioned by me, which are of general interest, are (1) that permitting "walls of 4½in. in thickness for buildings not exceeding 8ft. in height or 12ft. in length where such buildings are to be used for a wash-house, pantry, water-closet, earth-closet, privy, tool, or cycle-house only." This clause appears to me to require limiting to such structures when they are built as detached or semi-detached buildings, otherwise when enclosed in the main building they could be of 4½in. walls only; (2) that prescribing that soil-pipes and ventilating pipes to house drains shall, where carried up the side of a building, terminate at a point not less than 3ft. above the eaves or any dormer-window.

It is also provided that "where in cottages the drain takes away the drainage from a sink waste only, the ventilating shaft at the highest point of the drain may be of a sectional area of a pipe or shaft of the diameter of 3in." This clause is indefinitely framed, and it is not clear as to whether it is intended to apply to every house or to a group of houses. If the latter, the proposed reduction of size of pipe is inadvisable.

There is also a clause prescribing the paving of the open space at the rear of dwelling-houses over an area of 50 square feet, which is too limited, and should not be less than 100 square feet, and one permitting "any addition to an existing building which shall not exceed one-fourth the original size, to be built of the same material as the existing building, providing that in no case shall the addition be greater than one-fourth the size of the building when it was first built"—a clause which I think will be found to be quite supererogatory. These suggested bye-laws show the "drift" as to wherein relaxation of the existing model bye-laws is required. Inasmuch, however, as the Local Government Board are themselves preparing a new code for rural districts, it is doubtful whether those suggested will be approved by them, and it might be advisable to wait until the promised series is ready. Senex.

It is anticipated that the report of the Royal Commission on Sewage Disposal will appear before the close of the present year. It is not at all improbable that some of the members will present minority reports.

NOTICES.

ANNUAL SUBSCRIPTIONS.—The Annual Subscription to "THE SANITARY RECORD," for the United Kingdom, paid in advance, is 12s. 6d. For the Colonies and Abroad, 15s This includes postage, and a Copy of the Diary, post free.

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The Sanitary Record

AND

Journal of Sanitary and Municipal Engineering.

MAY 23, 1901.

THE SMALL OWNER.

IN a recent issue we pointed out some of the reasons which accounted for the laxity of public health administration in rural districts, the chief reason being the supineness of the Rural District Councils owing to the general character of their constitution. There are, however, other difficulties which are experienced to an equal degree by Urban Councils, not so much, perhaps, in the large towns, but, at any rate, in the ordinary county boroughs. One of these difficulties is the position of the small owner. We may illustrate the point by taking a typical case which was recently brought to our knowledge. Two properties were reported to the Local Authority by a certain Sanitary Inspector as nuisances in respect of a lack of proper sanitary accommodation. The usual proceedings were instituted for the removal or remedy of the nuisances, and in due course an order from the Court was obtained for the execution of the necessary works. The time limit for the execution of the works expired without anything having been done in either case. The next step, of course, should have been the execution of the works by the Local Authority, and the charging of the expense to the respective proprietors. In the one case, the owner being known to be a man in good circumstances, and the failure to comply with the order of the Court being due, probably, to obstinacy or sheer pigheadedness, no compunction was felt in carrying out the remedies provided by the Public Health Act. But in the other case, the owner was a widow, who pleaded extreme poverty as the reason for her inability to do what was required. The house of which she happened to be the fortunate—or unfortunate—owner was a small one, partly occupied by herself, and partly occupied by lodgers, from whom she derived the means of subsistence. For the sake of our illustration, we shall suppose that it was acquired by her by succession, an old house which had descended in the family. It represented her worldly all, and she had not the necessary capital to bring it up to modern sanitary requirements. In the knowledge of these circumstances, the Local Authority desisted from further prosecuting the matter. They did so on the ground that were they to carry out the necessary improvements, the expense would be irrecoverable from the owner except by attachment and sale of the property itself—an extreme measure which they hesitated to adopt—and, on the other hand, they did not feel called upon to expend public money in improvements which would enhance the value of the property, and so enrich the owner. The dilemma is easily intelligible, but the result was to leave the nuisance unabated. The whole proceedings were rendered fruitless, and an undesirable distinction was drawn between the well-to-do and the impecunious owners.

Now, according to our humble conception of the Health Laws, it is the duty of the Sanitary Authorities to carry out the provisions of the Public Health Acts for the removal of nuisances wherever they exist, without distinction of person, and irrespective of any considerations regarding the circumstances of the owners. It must be borne in mind that the ownership of property carries with it responsibilities as well as privileges. If owners are unable to discharge the responsibilities, they must forfeit the privileges, for the whole framework of our Public Health Acts rests upon the principle of the responsibilities incidental to ownership. If exceptional consideration is to be shown to the "small owner" the

consequence will be to make him an obstacle to sanitary administration.

It is customary in these days to read in certain sections of the Press philippics against the bloated owner of slum property, who makes his fortune out of the exorbitant rents he exacts from the suffering poor. It is not our purpose here to waste any sympathy on this class of person, who generally deserves all the abuse he gets, but the truth which lies in the opposite direction is apt to be overlooked. The modern tendency is to encourage working men to become their own landlords, and the ideal of a peasant proprietary is held up to us. From many points of view—the social, the economic, the political—we fully appreciate that ideal; but from the sanitary standpoint it is attended with certain difficulties, and even dangers. These are that the proprietor without capital will be unable properly to bear the burdens or discharge the responsibilities that are inseparable from ownership. In the ordinary course of sanitary administration it is often found difficult to get the small owner to carry out necessary improvements, not so much from lack of will as from lack of means. "The bloated slum owner," to whom reference has been made, is frequently more easy to deal with. He may be powerful, but he can be brought to his knees, and considerations of sympathy can have no place in dealing with him. In our illustrative case these humanitarian considerations formed the element of weakness. To attack a property for the expense of the improvements may seem hard, but if the only alternative is to allow the nuisance to remain, with the possibility of disease following in its wake, that may be even harder to the neighbourhood. Humanitarian considerations should have the fullest play, but they must give place to care for the public health.

The Usher Institute of Public Health.

One of the most princely benefactions to the University of Edinburgh in modern times has been the providing of a Public Health Institute by Sir John Usher, at a cost of £20,000. In making the gift, Sir John had it in view that the Institute, though handed over to the University, and placed under its immediate control, should also be available for the use of the Municipal Public Health Department, and nothing, we should imagine, could have been more suitable. The Institute, which is now rapidly approaching completion, has been designed and equipped in accordance with the most modern scientific ideas, and no effort has been spared to make it worthy of the great School of Medicine to which it is attached. In it the work of bacteriological examination will be carried out under the most auspicious conditions. All these advantages were intended to be placed at the disposal of the Corporation; rooms were to be placed at its disposal in the Institute; it was to have the use of the appliances for the examination and samples; and was, in short, to be saved the expense of independent buildings and equipment, as well as the salaries of a skilled bacteriologist and his assistants. The scheme of arrangements under which the Institute was to be placed at the service of the city has, however, been considered by the Public Health Committee, and they have decided that they are unable to recommend its acceptance. They consider, it is minuted, that the responsibility lying on the Corporation with regard to the public health of the city can only be met by having a complete bacteriological laboratory in connection with the new city hospital. The Public Health Committee may have excellent reasons for their decision, though we do not know what they are, but it seems to us at first sight that it will involve not only much overlapping of effort, but a very large unnecessary expense. The matter has still to be decided by the Town Council, and it is of such importance as to demand the most earnest and careful consideration.

A Good Beginning.

A few weeks since we recorded the arrival at Brisbane of Dr. Ham, the newly-appointed Public Health Commissioner for Queensland. The papers since received weekly have recorded various movements of Dr. Ham, by which it was clearly demonstrated that he intended to be something more than a mere ornamental head of a department. This week we have received copies of an interesting correspondence which has taken place between the Commissioner and the Brisbane Municipal Council. Dr. Ham has evidently been keeping his eyes open during his early connection with the capital city. He opens the correspondence by emphasising the importance of extra sanitary precautions being taken in order to prevent the plague again securing an entrance into the city. But there are other things he desires to have reformed. He finds that certain provisions of the Public Health Act are being contravened, and he requests the "Local Authority to be good enough to cause such inspection to be made, and such works to be executed, as will effectually abate such nuisances injurious to the public health" within its area. Appended to the letter is a list of about a dozen different places where nuisances were found to exist. They comprise foul drains, stagnant water, filthy premises, &c. A public convenience comes in for special condemnation. There is a "defective trap, and bad ventilation of the drain; uncleanliness of the premises, an old bell trap which allows sewer gas to escape freely," and so on. The Council is informed that prompt action is requisite, and that if this is not taken within fourteen days "an order will be issued instructing the Authority to do its duty in the matter." The letter is written in the most friendly spirit, and the Council immediately instructed the necessary works and inspections to be carried out. A further letter from the Commissioner deals with the question of trapping private drains, and contains some excellent suggestions to the Council for their future guidance. Dr. Ham's action in thus first dealing with the chief city of the Colony is having an excellent effect, and the other Authorities are

setting to work to put their affairs in order, and thus obviate the necessity of similar communications being addressed to them.

The Birmingham Water Scheme.

The Water Committee of the Birmingham City Council last week issued an interesting report on the progress made with the works which are to bring the new supply from Wales. From it we learn that the weather experienced in the Elan Valley since December has not been favourable to rapid progress in the execution of the works. At Caban Coch the dam has been completed to a height of 82ft. above the river, right across the valley, leaving a height of 90ft. still to be built. On the abutments an additional 28ft. has been built. The dam and viaduct at Craeg-ddu are practically as last reported, that is to say, only the roadway and parapets remain to be done. At Pen-y-gareg the wall is built up to 925ft. O.D., that is 20ft. below crest level; and at Craig Goch to 1030ft. O.D., or 10ft. below the crest, over which the viaduct has to be built. Considerable progress has been made with the excavation for the foundation of the Dolymynach Dam, and the driving of Dolymynach Tunnel is proceeding steadily, but the hardness of the rock encountered prevents very rapid progress. Good progress has been made with the lining of the Foel Tunnel, and with the portion of the aqueduct which is being carried out by administration. After referring to various contracts, the Committee show that the amount expended on the works in the Elan Valley during the year ended March 31st, 1901, was £181,859 8s. 4d., giving a total of £1,007,019 5s. The total rainfall registered on the watershed for the year 1900 was 63·04in. In order to permit of the re-arrangement of the farm holdings on the Elan Estate, which will be necessitated through the filling of the reservoirs at present under construction, notice has been given to the occupiers to terminate their present tenancies at Lady Day, 1902, and steps have been taken with a view to the rearrangement of the holdings, having reference to the altered conditions which will obtain when the reservoirs are filled.

A Voice from the Past.

The present unsatisfactory state of Capetown shows the folly of allowing towns, or even villages, to spring up without any regard to the laws of health and good sanitation. Thousands are to-day congregated in that town, and although it is the natural entrance by which emigrants enter South Africa, there is little or no provision for the accommodation of such a class. This fact has brought to the minds of some the memorable words of Sir Bartle Frere, on the eve of his departure from the Colony many years ago. His closing words were an earnest plea to the workers of the place to pay attention to the need for providing good houses, such as would be adopted to preserve health, and to secure happy homes in a crowded city. "What constitutes," he asked, "a good workman's lodging, what provision should be made for adequate water supply, good drainage, and other essentials for health in the building of a house, are matters in which many of your working men are masters of their craft. I would ask them to take a patriotic citizen's interest in spreading this knowledge among their less well informed neighbours and fellows. Let a few of them combine together to provide model lodging-houses for themselves and their families, to influence, as far as they legitimately may, the action of legislation, where legislation is required on the subject, and we may in future hear less of those terrible epidemics which occasionally decimate the younger portion of our population in South Africa, and which are, as you and I know, in the vast majority of instances, entirely preventable by reasonable care and adequate sanitary arrangements." Alas! all were then too much engrossed in the search for riches to heed the good advice, but the people have had to pay heavily for their neglect. An attempt is now being made to reach the ideal set forth by Sir Bartle, but the intervening years have left their mark behind, and much will have to be destroyed before any real good can be accomplished.

The Condition of Londonderry.

The constant recurrence of zymotic disease in Londonderry has long been a matter of comment, and some time ago the Irish Local Government Board sent down Dr. Bigger, one of its Medical Inspectors, to hold an inquiry into the sanitary condition of the district. He has now issued his report; his description of the place is sufficient explanation of the presence of disease in its midst. Speaking of the houses, he says that they are usually one-storey, and built with stone or brick, many of them having only two rooms; nearly all are self-contained, only a very few being tenement houses. In the older parts of the town the houses are old, dilapidated, damp, deficient in light and ventilation, some situated in narrow lanes and back passages; many are overcrowded, and are kept in a dirty state. The yards in many instances are unpaved, or only partly paved, and defectively drained; some have no back-yards and no back doors or back windows; others have a common yard and a common privy, which serves for several houses, but with few exceptions water is supplied in every house. Of the 7000 houses, there are 1340 houses under £4 valuation, 1970 houses valued between £4 and £6—in all, 3310 houses, being nearly half of all the houses in Londonderry, at or under £6 valuation. Dr. Bigger, in conclusion, urges the Corporation to give immediate attention to measures of reform. "The insanitary houses, many of which are not capable of being made sanitary, should be closed; the others should be so repaired and improved that they would be sanitary. Proper sanitary conveniences should be provided where required. In houses having no back entrances these should be provided where possible; but in the case of houses having privy middens, and where no back en-

trances can be provided should either be demolished or provided with water-closets and dry ashpits, instead of these privy middens, as the contents from these privy middens can only be cleaned out by the contents being carried through the dwellings, thus causing a nuisance which is injurious to the health of the occupiers. In houses having a back entrance, but with defective midden privies, these should be repaired, and the floors and sides concreted to prevent pollution of the subsoil. Lanes, passages, and small yards should be channelled, drained, paved, &c. Eave spouting should be erected where required. The manure depôts in Bishop-street and at Waterside should be closed. The various railway companies might be induced to erect manure sidings, so that manure might be carted there and emptied into wagons and taken to the country and sold. The Sanitary Authority might also erect a four or six-cell destructor for the purpose of destroying decaying vegetable matter and rubbish, &c. More attention should be paid to carrying out of the bye-laws, particularly those relating to dairies, cowsheds, and milkshops, and the keeping of animals."

Beverley's Noble Benefactor.

One of the best public gifts ever recorded has just been made to the ancient Corporation of Beverley. A public-spirited individual, who prefers to remain anonymous, has been quietly buying up the entire slum area of the district, and has now made a present of it to the Corporation, in order that it may be taken in hand and made fit for the habitation of human beings. Superficial people may question the utility of such a gift, but experienced men will at once see the enormous benefit conferred upon the ratepayers by such a gift. If it had been known that the Corporation was desirous of purchasing or dealing with this property, every difficulty would have been placed in the way of such action, and most probably the purchase, if made at all, would have had to be done through the exercise of compulsory powers, and at a largely enhanced cost. This, as is well known to our readers, is the worst item in all public improvements. But the gift now received will enable the Corporation to erect new buildings, which will not only be a great improvement to the district, but which they will be able to let out at rents within the reach of the poorer members of the community. It may be that the gift does not advertise itself so largely as a library or public garden would, but its real value is far in advance of these, great as their usefulness may be.

Advance in India.

From the *Punjab Gazette* we learn that an important alteration has been made in the old rules framed by the Punjab Government under the District Board and Municipalities Acts. The alteration is connected with the recent decision of the Local Government to appoint a Sanitary Engineer for the Province, who will be ready to advise and assist all Local Bodies in projecting and executing sanitary works. This officer will be in excess of the ordinary Public Works Department establishment, and in order to recoup the Government, for the expense entailed by his appointment, it is intended that Local Bodies utilising his services should pay fees therefor. As regards sanitary projects, the Sanitary Engineer and the Sanitary Board to be appointed will take the place of the Superintending or Executive Engineer as the approving Authority, and certain powers have been given to the Sanitary Engineer as to the agency by which projects are to be designed and for the supervision of their execution. The fees which Local Bodies will have to pay for these services are set forth in the revised rules. The advantage of the arrangement is that Local Bodies will obtain for the fees so paid by them the services of a specialist, who will be able to devote sufficient time to each project, especially in its preliminary stages, when insufficient study of the features of a case is liable to lead to the work being started on wrong lines. At a time when plague seems to have got a more settled hold of the Province than ever, and is spreading abroad through the rural tracts with unpleasant energy, the necessity of an improved system of sanitary administration does not need emphasising, and the Government may be congratulated on the timely innovation.

Sanitary Inspectors' Associations.

NATIONAL UNION: NORTH WALES DISTRICT CENTRE.

The fourth sessional meeting of the above was held at the Guildhall, Carnarvon, on Saturday, when papers were read by Dr. Fraser, Medical Officer of Health, Carnarvon Combined Sanitary Districts, and Mr. R. U. Parry, Sanitary Inspector, Gwyrfai, dealing with the recent small-pox epidemic in Carnarvonshire.

Mr. Ernest Worrall, Surveyor, Penmaenmawr, presided over a goodly and representative attendance of members.

Dr. Fraser stated the source of the outbreak had been clearly traced to a visitor from one of the large towns. Altogether some seventeen cases occurred during a period of four months; fourteen recovered and three proved fatal. All those who recovered had been vaccinated, whilst of the three fatal cases, two had not been vaccinated, and the third case was exceedingly doubtful. He described in detail the preventive measures adopted, which included prompt removal of patients, thorough disinfection of houses and goods, and quarantine. So completely were these carried out that only in one house did a second case occur, and here gross carelessness of the inmates was proved. He eulogised the services rendered by the District Inspectors, and emphasised the necessity for the erection of hospitals to be in readiness for any such outbreaks.

Mr. Parry described the difficulties encountered from the people in putting the remedial measures into force, many of them failing to properly realise that small-pox was in the district until the deaths became chronicled, when but little further resistance was shown.

A discussion ensued, at which the readers of both papers were thanked.

Public Works.

SEWERAGE.

Sanction has been obtained by the Wantage Urban District Council to the borrowing of £5800 for sewerage and sewage disposal.

The Bideford Urban District Council has obtained permission to borrow £2500 for carrying out the East-the-Water drainage scheme.

Colonel Slacke held an inquiry at Hungerford last Tuesday in connection with the application to borrow £5812 for the purpose of sewerage and sewage disposal.

The Blaby Rural District Council has adopted another scheme of sewerage for the parish at an estimated cost of £7500. The Leicestershire County Council has approved the scheme, and application will be made to borrow the money.

Mr. Lawford, the Engineer, attended before a meeting of the Langport Parochial Sanitary Committee last week for the purpose of consultation on the sewerage scheme. In reply to questions, he said that in his opinion the scheme suggested for adoption was the cheapest and best. The earth-closet system would satisfy the Local Government Board, but it would become more expensive in the long run, and was better adapted to scattered districts rather than to towns. It was eventually decided to appoint a deputation.

The Bradford Corporation Bill again came before the Committee of the House of Commons of which Mr. Heywood Johnstone is chairman, last week. The opposition to the sewage proposals of the Bill was continued. Mr. Samuel Rideal, consulting chemist, of London, was further examined by Mr. Longstaffe. He said the Bradford sewage was of a very weak character. Finally the Committee proposed to give compulsory powers to the Corporation to take for this purpose land on the south of the river as far as Strangford-hill.

Last week's ordinary meeting of the Leeds Corporation Sewerage Committee was invested with special interest in consideration of the recent rejection of the Gateforth sewage scheme by the House of Lords Committee, and there was a fairly good attendance to hear from the lips of the chairman (Alderman T. W. Harding) an account of the Westminster proceedings. The Chairman having made his report, various possibilities and contingencies were talked over, and the situation generally was discussed. It was, however, deemed advisable not to allow any expression of opinion to go forth to the public at present, and in order to ensure due secrecy the Corporation officials at the meeting were asked to retire while the subject was being debated. Afterwards Alderman Harding excused himself from making any statement to the Press, on the ground that it is obviously impossible for the Committee to be in a position at this early stage to come to a definite conclusion as regards an alternative or revised scheme. We understand, however, that the feeling of the meeting was averse to any abandonment of the Gateforth project; and it may be that, as happened in the case of Bradford, a recommendation will be forthcoming ere long in favour of another application to Parliament on modified plans. One of the points to be carefully considered in that connection is the possible attitude of the West Riding Rivers Board; but this, along with suggestions that may occur during the next few weeks, will probably occupy the Committee's attention at more than one subsequent meeting. Meanwhile, the Chairman proposes at the next meeting of the City Council, on June 5th, to review the whole circumstances of the case, and opportunity will then be afforded for free discussion.

Sanction has been obtained to the borrowing of £50,000 for sewerage and sewage disposal works at Stamford, and tender for a loan will be invited at once.

The Halesowen Council has decided to apply to the Local Government Board for sanction to an additional loan of £1438 required for the completion of the Hill sewerage system.

The West Penwith Council has authorised the chairman to affix the seal of the Council to a mortgage on the rates of Marazion for a loan of £1040, for carrying out sewerage works.

At a recent meeting of the Sewerage Committee of the Aberdeen Town Council correspondence was submitted with the Aberdeen Land Association with regard to the Bleachfield Burn. It was resolved that the Town Council should take over the Burn and cover it in as a stone water culvert, at a cost of £1460. It was calculated that this expenditure would save an outlay in another direction of over £1600. A letter was read from the Board of Trade agreeing to the construction of the outfall at Girdleness.

At the Moffat Town Council meeting recently, plans and estimates prepared by Mr. T. O. Niven, C.E., Glasgow, for a scheme for the purification of the burgh sewage by bacterial treatment was submitted. The total estimated cost of the works is £4137; £450 is reckoned for engineer, inspection, and legal outlays, and £225 for wayleave and tenants' claims for compensation, making a total of £4812. The plans and estimates were approved, and the Clerk was empowered to secure a loan of £5000 to meet the expenses of the scheme. Provost Kennedy was appointed the representative of the burgh to attend a meeting of Local Authorities (county and burgh) to be held at Dumfries, with a view to providing a combination hospital for the separate treatment of small-pox.

WATER.

In consequence of the opposition having been withdrawn, the Rugby Water and Improvement Bill has been taken from the consideration of the Committee of the House of Lords, before which it was to have come along with several other Bills in the course of this week, and referred back to the Earl of Morley as chairman of the Committee on Unopposed Bills.

The Bill under which the Urban District Council of Broadstairs and St. Peter's seeks power to purchase the undertaking of the Broadstairs Water Company, to construct additional waterworks for the public supply, and to make further and better provision for the improvement, health, local government, and finance of the district, appeared in the list of proceedings before a Select Committee of the House of Lords last week.

At length Barrow-in-Furness is in the way of obtaining the much-needed additional water supply, the essential enabling Bill having been passed by the House of Lords Committee. The supply will be obtained from the upper valley of the Duddon and from Seathwaite Tarn, with the stipulation that the Corporation shall not take more than the amount of water they want—that is to say, 2,000,000 gallons a day when there is a daily flow of 5,000,000 gallons, and not more than 3,000,000 gallons at any time.

The Llanelly Urban Council is constructing an additional reservoir at a cost of £67,000. The Surveyor reported progress to a special meeting of the Waterworks Committee on Thursday, and subsequently the members inspected the work. The contract provides for completion of the work in July of next year, but the contractor, Mr. Louis P. Nott, is prepared to bring it to a finish in March for a consideration of £1000. After providing several extras, the actual cost, it is expected, will be some £4000 below the sum borrowed for the work.

For the week ending May 4th 195,752,000 gallons of water were supplied by the Liverpool Water Committee to Liverpool and other places within and outside the compulsory limits. The supply for the week ending May 11th was 188,812,000, both weekly figures being beyond those for the corresponding weeks of last year, and due to some extent to the summer-like weather.

At a recent meeting of the Merthyr Waterworks Committee the proposed construction of a line of water pipes from the Upper Neuadd reservoir to Dowlais for the purpose of additional water supply was discussed at some length upon a communication on the subject from Mr. Deacon, C.E. It now appeared that as the cost of iron had decreased it would be more advantageous to go in for the high-level scheme with iron pipes than to construct on a lower level a line of earthenware pipes. It was decided that Mr. Deacon be authorised to lay before the Committee specifications and drawings for the high-pressure supply of the two alternative quantities of water.

The Water Committee of the Glasgow Corporation at a recent meeting had under consideration the rates to be charged for water during the coming year. It was reported that there was a deficit, mainly due to an increase of £8000 in the interest charges during the past year and the cessation of the steady expansion of the demand for water for trade purposes which has been going on during the past decade. There has also been an increase in the working expenses, and the decision by the House of Lords with reference to the payment of teinds represents an expenditure of £4000. It was unanimously agreed to retain the domestic rate within the limits of compulsory supply at 5d. in the £1, and that outside the limits of compulsory supply at 10d. in the £1, also to retain the public water rate at 1d. in the £1, but to raise the meter charge from 30s. per 100,000 gallons to 33s. 4d., the 3s. 4d. of an increase being the amount of the decrease which took place two years ago.

A Local Government Board inquiry has been held at Gloucester just recently with reference to the application of the City Council for sanction to borrow £7000 for works of water supply, including the construction of works in the parishes of Newent and Upleadon. The Town Clerk briefly explained the object of the application, saying the Corporation had accepted, subject to the approval of the Local Government Board, the tender of Messrs. Cruwys and Hobrough, Gloucester, amounting to £6968 2s. 10d., for constructing an additional service reservoir at Madam's Wood, Upleadon, near Newent; and it was decided to ask for a loan of £7000 in order to cover incidental expenses. The proposed new reservoir would have a capacity of 1,250,000 gallons, which, added to that of the existing one, which held 600,000 gallons, would make provision for 1,850,000 gallons at Newent.

A Local Government Board inquiry was held at Rowhedge last Thursday in respect to the application by the Lexden and Winstree Rural District Council to borrow £3100 for works of water supply for Rowhedge. Dr. J. W. Cook explained that the water at the present time was derived from a well at the top of Albion Hill, a spring in the brewery grounds, a brook in Chapel-street (which water was of a very doubtful character), and private wells. The sewage was discharged into the river through old drains, and it was very possible that the sewage from those drains might pollute some of the present wells. In 1893 an outbreak of typhoid occurred, and an analysis made of the water in the wells proved unsatisfactory. The scheme, as now put forward, was then prepared, but on account of the opposition of the parish the matter dropped. The scheme generally was to obtain the water from the deep well at the brewery. It was sunk 305ft., 175ft. being into chalk. The analysis made the previous week by Dr. Thresh showed that the water was good

A special meeting of the Finance and General Purposes Committee of the Withernsea Urban Council was called last week to consider the water supply question. The Surveyor (Mr. Savile) read his report as to a visit of inspection to Welwick with Mr. George Cammidge. He said that as far as outward appearances went there seemed to be an abundance of surface springs. He did not recommend Welwick as a site for waterworks, as it was some distance from the railway station, which would necessitate a heavy cartage bill for coals, and then the cost of laying pipes from thence and royalties would be pretty considerable—about £7000. After discussion, the question was again adjourned.

The contract for the erection of a large new pumping station at Wimborne for the Bournemouth Water Company has been placed with Messrs. Burt and Vick, builders and contractors, of Poole. For a long time past the work of excavating a well has been in progress, and is now completed. The company has been lucky enough to find a splendid supply of water. The well is 200ft. in depth, and about 10ft. in diameter, and has a capacity of three million gallons per day. It is over this well, which is situate near Walford Bridge, that the pumping station is in course of construction, with all the other necessary buildings, including boiler-house, coal store, workshops, small reservoir, &c. We understand that the contract price exceeds considerably more than £6000, and it will take probably close upon twelve months to complete the work. The contract was obtained by Messrs. Burt and Vick, who were in competition with a large number of other firms in the neighbourhood.

Last week the members of the Waterworks Committee visited Walshaw Dean for the purpose of viewing the progress being made with the new reservoirs. They left the Town Hall at ten o'clock in two wagonettes, and were accompanied by the chairmen of the other committees, the Town Clerk (Mr. Keighley Walton), Mr. Hill (the engineer), Mr. Tempest (the contractor), and other officials. The company first alighted at White Hill Nook, and had a look round Dawson City. Then they journeyed by the new tramway to Blake Dean Bridge—a distance of three miles. From this point they were driven forward to Walshaw Dean. Nearly 200 men were found at work, and great headway is being made with the puddle trenching of the embankment of the first reservoir. The work of preparing the second embankment is also in progress. So far, in the trench driving, nothing of a loose or unsatisfactory character has been met with. When the bridge at Blake Dean, crossing the Hebden, has been completed, it will be possible to run trams right to the second embankment, a distance of 5½ miles. It is expected this work will be finished towards the end of the month, and then rapid progress may be looked for. In about a month's time there will be eight locomotives on the works at one part or another. Leaving Walshaw Dean the Committee made their annual inspection of Widdop reservoir, and found everything in good order.

LIGHTING.

We understand that the Parish Council of Trefriew has come to an arrangement with the Electric Lighting Company, with a view of lighting the popular country health resort.

The directors of the Cape Town and District Gas Light and Coke Company recommend payment of a dividend on the ordinary shares at the rate of 11 per cent. per annum for the half-year ended 31st December last, making a total dividend of 10 per cent. for the year 1900, as compared with 9 per cent. for the previous year. A sum of £7500 has been placed to reserve, and £1684 carried forward to next year's accounts.

The Alfreton Gas Bill, which has passed the Lords, last week came before the Chairman of Ways and Means as an unopposed measure. The preamble was proved, and the Bill was sent for third reading in the Commons.

The New Swindon Gas Bill, which confers a number of further powers on the company, last week complied with the Standing Orders of the House of Commons, and was sent by the Examiner for second reading in the Lower Chamber. The Bill has passed through the House of Lords.

The Paisley Town Council met in committee last week and agreed to oppose the application of the promoters of the Clyde Electric Supply Bill for a way-leave through Paisley, and to lead evidence to show that it would be less expensive to keep outside, and that the route would not be much longer.

For the first time in the history of the Leeds Corporation Gas Department, the number of meters in the city has reached six figures. On April 30th, according to a return which has since been placed in the hands of a Corporation Sub-committee, there were in use 86,951 ordinary meters, 9454 prepayment meters, and 3817 prepayment meters with "cookers," giving a total of 100,222 meters.

Islington is not alone in having had to face, as the result of last year's working of its electric lighting installation, the unpleasant fact of a loss. From a report just issued it seems that Portsmouth has lost £1000 in the year ending March 31st last on its undertaking, which is an older one than that of Islington. In 1900 there was a profit of £1250 on the Portsmouth installation, while in the previous year there was a profit of £2,475, of which £1000 went to the relief of rates, and £1,475 to the reserve fund. To fall upon a year of a dead loss of £1000 is the reverse of consoling after profits such as those above mentioned. The loss is ascribed to the high price of coal.

The Mayor and Corporation of Bermondsey have been sued in the King's Bench Division by the South Metropolitan Gas Company for £884 2s. 3d., for gas supplied to the baths and washhouses at Rotherhithe. Since 1881 the person who had read the meter had made the mistake of reading the dial, which indicated that 1000 feet had been consumed as if only 100 feet had been consumed. The total amount consumed and not paid for was £2987, but the statute of limitations being pleaded, only £884 2s. 2d. could be claimed. The facts were not disputed, but the Borough Council were doubtful if they could lawfully pay the money. They could not make a retrospective rate, and they could not take money which was in the hands of the treasurer to pay the debts of the late vestry of Rotherhithe. Judgment was given for the plaintiffs for the amount claimed.

Last week the Select Committee of the House of Commons, of which Colonel Welby is chairman, further considered the Mond Gas Bill, under which power is sought to form a company to supply a patent producer gas which has been invented by Dr. Ludwig Mond, to an area of about 135 square miles in South Staffordshire. According to the promotors, the gas can be profitably supplied in large quantities at an all-round price of about 2d. per thousand cubic feet, at which price it will largely benefit the district by enabling manufacturers to provide themselves with power at a far cheaper rate than they can at present obtain it by means of coal gas or electricity. The preamble of the Bill was passed at a former sitting of the Committee, and the promoters now brought up clauses carrying out the conditions on which they approved the Bill. The clauses having been adjusted, the Bill was ordered to be reported to the House.

The Long Eaton Gas Bill, which has passed through the Commons, came on Friday before the Examiner. He found that the Standing Orders of the House of Lords had been complied with, and reported the Bill for second reading in the Upper Chamber.

The formation of the roads at Provan Gasworks has been so much delayed that the Corporation has cancelled it. The unfinished work has been taken in hand by Messrs. M'Alpine, the builders of the gasworks, and they will complete the contract for a sum slightly over £8000.

The Colwyn Bay and District Gas Bill, which provides for the transfer of the undertaking of the Colwyn Bay and District Gas Company to the Colwyn Bay and Urban District Council, came last week before Lord Morley's Committee as an unopposed measure. The preamble was proved, and the Bill will be sent for third reading in the Upper Chamber, after the production of the report of the Local Government Board and the minute of the Council's adoption of the scheme.

The preamble of the Clyde Valley Electric Power Bill having been passed by the House of Commons Committee, presided over by Sir James Woodhouse, the Committee met last week for the adjustment of clauses. Mr. Wilson, on behalf of the promoters, asked that they should be allowed to carry their mains through Paisley, else it would result in an additional expenditure of £20,000. Mr. Pollock objected to the decision of the Committee being upset on clauses. In the course of subsequent discussion, the promoters said they would not ask permission to carry their mains through Port-Glasgow. A clause by the promoters suggesting that subscribers might be allowed to use 25 per cent. of the power taken for motive purposes for lighting was objected to by Mr. Pollock, who thought 5 per cent. quite sufficient. The Chairman said that was a very important matter, as it had come up for the first time, and the decision of the Committee might form a precedent. The engineers on both sides, therefore, ought to assist the Committee without viewing the case solely from the point of view of this Bill.

In connection with the forthcoming introduction of electric light in Dalkeith, certain minutes of the Electric Lighting Committee have been laid before the Dalkeith Town Council, and these point to a satisfactory introduction of the light within the next two years. At a meeting of the Committee held on the 19th April, a letter was laid before the members, forwarding a copy of the Provisional Order in the form in which it was proposed to be issued, and requesting any observations to be made thereon which might be thought necessary. The additions to the Order since it was lodged were considered, and it was thought that as these were in favour of the Council by shortening the periods for taking over the works by the Local Authority and reducing the maximum price of electricity for public consumers, no observations thereon were deemed necessary. Mr. Sturrock, the Town Clerk, was, however, instructed to write the Secretary of the Board of Trade, intimating the agreement which had been entered into between Messrs. Crompton and Company, Limited, and the Council in regard to the public lighting of the streets of the burgh, and it was understood that this amendment was not controlled by the Provisional Order. A reply has been received from the Secretary of the Board of Trade referring the Dalkeith Council to Section 34 of the Electric Lighting Clauses Act, under which the questions of the supply for public lighting is left to be determined between the Local Authority and the promoters. This is a satisfactory confirmation of the arrangement mutually arranged by the Messrs. Crompton and the Dalkeith Committee.

GENERAL.

A Local Government Board inquiry was held at Yarmouth last week with reference to the application of the Council for sanction to borrow £1210 for works of street improvement.

Mr. F. H. Tulloch, C.E., an Inspector of the Local Government Board, held an inquiry at Richmond recently into the application of the Town Council for sanction to a loan of £1108 for street works.

The Strood District Council has decided to hold a special meeting to consider the question of providing a sanatorium for its district. An arrangement with Northfleet is probable, which would help them in regard to the cost.

At the annual general meeting of the Sick Nursing Association, at Sutton-in-Ashfield, it was reported that during the past year the nurse had paid 6898 visits to 211 cases, and had also been present at seven operations. This is the most remarkable record we have yet seen of the work done by a village or district nurse.

The Local Government Board recently ordered an inquiry into the prevalence of enteric fever at Ilkeston. The report of the Board's Inspector, now issued, states that the borough has not been free from enteric since 1881, and he regards the prevalence of the fever to be due, in all probability, to the pollution of the general water supply taken from the Nutbrook.

An examination of the Provisional Order granted by the Local Government Board with regard to the Quarry-hill insanitary area scheme of the Leeds Corporation shows that the Model Lodging-house, St. Patrick's Roman Catholic Church, the Hope Inn, and part of Riley's property have been eliminated from the scheme. With these exceptions the scheme is approved.

Preliminary steps have been taken for preparing a Bill to be promoted in Parliament for the construction of an electric light railway direct between Canterbury and Herne Bay, starting from Rhodans-town, Canterbury, and proceeding thence down Bridge-street, up the Military-road, and on to the Sturry-road. The scheme is independent of the Canterbury and Herne Bay Electric Light Railway.

The Financial Committee of the Glasgow Corporation recommends that the expenditure incurred in connection with the bubonic plague and small-pox outbreak in so far as it is in excess of the revenue of the year, should, to the extent of one-sixth, be included in the accounts of the present financial year, and carried forward as a deficit against the revenue of next year, and that the remaining five-sixths be charged in equal proportions against the revenue of next and four succeeding years—thus debiting next year (1901-02) with two-sixths of the entire deficiency, and each of the four following years with one-sixth.

The following from the *Cape Argus* describes some of the occurrences at a recent meeting to appoint additional sanitary officers. It says:—"The Mutual Hall was filled on Tuesday morning with applicants for the five new creations in the ranks of the Sanitary Inspectors. They consisted of all sorts and conditions, for in these plague days the hardened rogue just out of gaol, and the tender youth whose education has been neglected, excepting what he has picked up in the streets, consider themselves equally qualified with the most experienced for any post connected with municipal affairs in this city. One persistent person, in answer to a question as to what he knew about sanitation, said, 'No, I don't know the gentleman, but I understand what it is to be clean.' Being pressed further on the point, he said he had a Sunday bath regularly, and he was sure he could get other people to follow his example and be clean also. That candidate is still waiting for a billet, and so are most of the others."

The London County Council has agreed to lend the Shoreditch Borough Council £2440 for baths and wash-houses, and the Camberwell Borough Council £10,710 for the purchase of the freehold of its depôt.

The Town Council of Penzance is seeking the advice of its Medical Officer as to the proposed examination of dairy cows supplying the town with milk, for the purpose of ascertaining if the animals are suffering from tuberculosis.

At last week's meeting of the Hornsey District Council it was stated that a further six acres of land had been purchased adjoining their workmen's dwellings at a low rate, and that that would be utilised for the erection of more dwellings for the working classes.

A Local Government Board inquiry has been held at the Town Hall, Scarborough, relative to the application of the Town Council for sanction to borrow £1100 for the purposes of public walks and pleasure grounds in Manor-road, including the erection of public conveniences.

Numerous improvements have been effected at Weston-super-Mare since last season, others are in progress. The electric light works and the Queen Victoria Memorial (Free Library and Museum) have been completed. A pavilion and a third swimming bath, each to cost about £10,000, are being erected; a portion of the sea-front promenade is being widened at an expenditure of over £4000, and the new low-water pier is approaching completion. Free promenade concerts by the band of the Royal Artillery (Mounted) and other attractions are announced for the season.

On Saturday last Mr. J. White, Mayor of the Metropolitan Borough of Lambeth, presided over a large company at the Holborn Viaduct Hotel, who had assembled to celebrate the inauguration of the Borough. The Lord Mayor and Sheriffs were present, as well as most of the local Members of Parliament. Some interesting circumstances were brought out by the Lord Mayor in the course of his speech. Proposing the toast of the "Borough of Lambeth," he said it was the first time upon which the Lord Mayor of London had had the distinguished honour of proposing success and prosperity to the Borough of Lambeth, and he regarded it as a very important privilege, and one of the most pleasurable character that it had fallen to him to propose such a toast upon that occasion. They expected a great deal from the new Municipalities. The Borough of Lambeth covered 18 square miles, and contained 301,873 inhabitants, so that it was the second largest of the London Boroughs, and the eighth largest of the Boroughs in the Kingdom. They were all gratified to know that the Borough occupied such an important position in the Kingdom. In Lambeth they had five public libraries, and conjointly with other Boroughs controlled two more. The rateable value of the Borough was £1,857,808—a very large and important rate for a Municipality to have. With such a large rating power, it was of importance that the Council should embrace men of business, who were capable of carrying on the business of such an important Borough. The roads of which they had control were 160 miles in extent, and the Council numbered ten Aldermen and 60 Councillors, besides the Mayor. The Borough of Lambeth was full of historic interest. There was one Charter which went back to the time of Edward the Confessor; Kent-street occupied the site of one of the old Roman roads; and Lambeth Palace was full of historic associations, with its Lollard's Tower and other memories. He had, therefore, great pleasure in proposing the toast, and coupling with it the name of the Mayor. The Mayor replied, and referred to the position which the Borough occupied, and the work which the several Committees were carrying on. He hoped they would not fall short of the high standard expected from them in the future.

THE "penny-in-the-slot" telephones of Paris have not proved a success, and are to be closed.

A MOVEMENT is on foot in Manchester to municipalise the property at present owned by the Crematorium Company of that city. It is said that it can be purchased for £9000.

AN official notice has been issued by Dr. Charles Sanders, the Medical Officer of Health for the Borough of West Ham, stating that a severe epidemic of typhoid or enteric fever is raging in Canning Town and the surrounding districts. Dr. Sanders warns the inhabitants against eating ice cream, and allowing their children to partake of "hokey-pokey."

THE Select Committee of the House of Commons, presided over by Mr. Seale-Hayne, after several days' investigation, has found proven a Bill promoted by the London County Council to enable it to construct a number of new tramway lines, principally in the South of London, and to carry out certain street widenings. The Committee rejected provisions for the extension of a tramway along York-road, Lambeth, which was objected to by the South-Western Railway Company as hampering its Waterloo Station traffic, and also threw out the Farringdon-road extension, which was opposed by the Great Northern, on the ground of interference with its goods traffic.

AFTER three years' controversy among themselves and with the Local Government Board in regard to the site of a fever hospital—the present site and buildings being held by the Board to be unsuitable—Musselburgh Town Council last week, on a division, decided, on the motion of Mr. Kitto, that a full statement of the case regarding the hospital be laid before the member for the Leith Burghs, with the request that he ask a question in the House of Commons as to whether the Local Government Board are not exceeding their powers in ordering the hospital to be removed from its present site in consideration of the fact that a loan was granted, extended for the period of twenty-five years, for the purpose of providing the present hospital.

THE Tramways Committee of the Lancaster Corporation last week had before it a proposal from a Birmingham syndicate for the acquisition by them of the whole of the powers to construct and maintain electrical tramways in the borough obtained in the Lancaster Corporation Act, 1900. The scheme of the Corporation involves a cost of £70,000, and provides for a net-work of tramways on the overhead wire principle, bringing the growing suburbs of Scotforth and Skerton into touch with the centre of the borough. The Skerton length for the present is delayed because negotiations fell through with the Lancaster and District Tramways Company, who possess a line four miles in length from Lancaster to Morecambe, which is worked by horse power. The Corporation made the offer of 15s. per £1 share. This the shareholders refused to accept, and the negotiations dropped. The syndicate first had their eye on the Morecambe trams, and in approaching the Lancaster and District Tramways Company, which has done better in recent years, made the offer to buy out the undertaking at par, provided the directors were able to get the Corporation to give them a lengthy renewal of the lease over the Lancaster portion of the line. The syndicate at the same time made the proposal to the Corporation of Lancaster in the hope that it would follow the example of Barrow-in-Furness and sell its powers for the construction of the electric tramways. From what transpired at the Committee meeting last week, however, it is very improbable that the Lancaster Corporation, having made several efforts to municipalise its tramways, will, when within reach of the desired goal, barter away its rights, even though large inducements may be held out.

THE first meeting of the newly-elected managers of the Metropolitan Asylums District was held on Saturday last at the office of the Board. On the motion of Mr. E. White, seconded by Mr. T. Helley, Mr. R. M. Hensley was unanimously elected to fill the office of chairman for the ensuing twelve months, in succession to Sir E. Galsworthy; and on the motion of Mr. Drage, seconded by Mr. A. C. Scovell, Mr. J. G. Talbot, M.P., was re-elected vice-chairman.

SOME months ago some rather high death-rates were recorded in the large towns of the Punjab. These figures, however, are more than kept in countenance by the vital statistics of the neighbouring Province, just issued. The water-logged town of Kosi, in the North-West Provinces, heads the list with the alarming figure of 78 per 1000. Other notably unhealthy towns are Gonda, 56 per 1000 (defective drainage); Haldwani, 54 per 1000 (unsatisfactory sanitation); Dhanpur, 52 per 1000 (outbreak of cholera); Cawnpore, 51 per 1000 (urgent need for sanitary reform); and Ghaziabad, 49 per 1000 (pneumonia).

ON Monday last, in the House of Commons, Mr. Chaplin asked the First Lord of the Treasury if his attention had been called to the difficulties which arose under Standing Order 22, in the making of tramways in London, in order to facilitate the housing of the working classes; and whether, having regard to the pledges given by the Government in relation to that subject during the last Parliament immediately before its close, the Government proposed at an early opportunity to take measures to give effect to those pledges. To him Mr. Balfour replied he was not aware of any specific pledge of the kind mentioned by his right hon. friend, though undoubtedly there were very strong arguments to be urged in favour of the course he wished to see adopted. The alteration, however, of the Standing Orders would not complete the reform he desired. It would require legislation in addition. Mr. Chaplin continued his quest, and inquired, "Is my right hon. friend not aware, or has he forgotten, that on the third reading of the Housing of the Working Classes Bill I myself gave, on behalf of the Government, a pledge to this effect?" But Mr. Balfour was not to be drawn, and replied, "It has either escaped my memory, or my attention has not been called to it."

THE proprietors and factors of slum property in Dundee are up in arms against those who are charging them with being responsible for the unsatisfactory condition of certain portions of the town. They have memorialised the Town Council, and claim that they would be the last to deprecate any action calculated to improve the health and morals of the community and state that they were, perhaps, better acquainted than most people with the conditions obtaining in Dundee. They aver that it is contrary to reason to suppose that landlords and factors should suffer their properties to get into a state of disrepair. They record their objections to regulations for the provision of sanitary appliances which would never be used by the tenants, and against a one-sided agitation such as is at present being engaged in. It is alleged that the Cleansing Department itself does not carry out the enactments of the Dundee Police Acts in regard to the emptying of ashpits and other matters of sanitary administration. So far as sanitary appliances are concerned, it is asserted that a certain class of tenants grossly neglect their duty of keeping such in proper order, and that the Authorities, whose position, judged by a recent magisterial decision, have not done all in their power to check insanitary practices detrimental alike to the landlord's property and to the health of the tenants inhabiting it. An expression of opinion is given that the present division between the Sanitary Department and the Cleansing Department is not in the public interest. In this connection house factors complain that where an order given by the

Sanitary Department is carried into effect, the Cleansing Department has more than once declined to proceed with its work under the new conditions created thereby. The memorial, from the house factors' point of view, deals exhaustively with the question of insanitary tenements. The signatories and members of the Association are hopeful of being afforded an opportunity of appearing before the Sanitary Committee and Town Council in support of their views. On the part of some of those representing property interests it is asserted that the Authorities are shielding themselves behind the proprietors as an excuse for not carrying out and exercising to the full their powers of cleansing and supervision.

PERSONAL.

Mr. P. F. Rett has been appointed Assistant Sanitary Inspector for Lowestoft.

Mr. W. A. Nicholson has been appointed Surveyor for the Rural District of Halstead.

Mr. F. A. Ward has been appointed Assistant Engineer for the Rural District of Chelmsford.

Messrs. H. E. Anderson and J. H. Sutcliffe have been appointed Assistant Surveyors for Lambeth.

Dr. Gray has been re-appointed Medical Officer of Health for Holsworthy, and Mr. Webb Surveyor and Inspector of Nuisances.

Mr. M. Roberts has been appointed an Assistant Sanitary Inspector under the Leeds Corporation, and is located to the Holbeck division of the city.

The Local Government Board has sanctioned the appointment of Dr. Berryman as Medical Officer of Health for Llandovery, and Mr. John Roderick as Sanitary Inspector.

Mr. Trevor Duesbury, Chief Assistant Engineer at the City of Gloucester Electricity Works, has been unanimously elected Resident Electrical Engineer for Sutton Coldfield, at a salary of £200 per annum.

The Local Government Board has sanctioned the re-appointment of Dr. Boulton as Medical Officer of Health for Woodhall Spa, and Mr. Brocklesby Crookes as Inspector of Nuisances for another year at the same salary.

Mr. Edward C. Dutton, M.B., Ch.B. (Victoria), who for the last twelve months has been the senior resident Medical Officer at the Stockport Infirmary, has been appointed a Civil Surgeon (attached) to the forces in South Africa.

The term for which Mr. Thomas Michell was appointed Sanitary Inspector of Paddington, viz., one year, having expired, the Borough Council have re-appointed him at his present salary, £100 a year, pending the re-adjustment of salaries which is now under the consideration of the Special Staff Committee.

Lieutenant-Colonel W. G. King, C.I.E., I.M.S., Sanitary Commissioner, Madras, has recently left on leave for about six months. In his absence, Major A. E. Grant, I.M.S., Deputy Sanitary Commissioner, will act as Sanitary Commissioner, his place being taken by Captain J. W. Cornwall, I.M.S., Health Officer of the Madras Municipality, Mr. K. Mathew, Assistant Health Officer, acting as Health Officer until the Government of Madras can depute an officer to act for Captain Cornwall. This is the first time that Sir George Moore's suggestion, made some time ago and accepted by the Government, has been acted upon, namely, that the Health Officer of the Madras Municipality should be appointed by Government, with a view to recruiting the Deputy Sanitary Commissioner from that office. The arrangement has a two-fold use; it ensures for Government a trained officer as a sanitarian, and it secures for the Municipality a higher class of officer than it might otherwise secure for the salary.

OBITUARY.

DR. SPRAKELING.

Many will regret to hear of the death of Dr. Robert John Sprakeling, M.R.C.S., Eng., and L.S.A., Lond., J.P., who died at his residence, 58, Merton-road, Bootle, at an early hour on Wednesday, the 15th inst. Deceased, who was sixty-eight years of age, had been ailing for some time past. For close upon thirty years he had held the position of Medical Officer of Health to the Bootle Corporation with conspicuous success. In fact, he was the first medical gentleman appointed to this office since the incorporation of the borough in 1868. The deceased during his long official connection with the Corporation discharged his duties in an able and satisfactory manner. His knowledge of sanitary matters was wide and accurate, and it was mainly through his strong recommendations that there has been such a great improvement in the sanitary condition of Bootle during recent years. Ever since his appointment he took a special interest in everything that tended to improve the public health of the town. His annual reports, in which were embodied short but lucid intelligent accounts of the progress of sanitation in the town, upon all occasions were of a most interesting nature. The deceased gentleman was a member of the first Council elected in Bootle, being returned a representative for Knowsley Ward, but he retired in 1872 in order to take up the position of Medical Officer of Health. In 1885 he was appointed a justice of the peace for the borough, and in every respect he proved a most popular magistrate. For a number of years he acted as Medical Officer for the Bootle district in connection with the West Derby union. Deceased, who was an old member of the Bootle Lodge of Freemasons, has left a widow and grown-up family.

MR. WASHINGTON LYON.

We regret to announce the death of Mr. Washington Lyon, of Clifton House, Asylum-road. Mr. Lyon, we gather from a contemporary, was a Scot, who, upwards of half a century ago, founded the bleaching works in Leo-street, Camberwell, in partnership with his brother. After the Metropolis Local Management Act came into operation, Mr. Washington Lyon was elected to the Vestry (1856), and continued a member of that body until 1894, holding office as chairman of the Sewers and Sanitary Committee. From 1874 to 1886 he represented the ward of Cornhill on the Court of Common Council, being during that period chairman of the General Purposes Committee and chairman of the Port Sanitary Committee. Mr. Lyon will be best remembered by our readers as the inventor of the Washington Lyon Steam Disinfector, which entirely revolutionised the inefficient and unsatisfactory methods of disinfection previously in use, and which has been adopted throughout the world. The deceased gentleman had reached the ripe age of eighty-two, and the sanitary world will be the poorer for his loss.

Dr. Seaton, M.O.H. for the County of Surrey, makes reference in his annual report to the unsatisfactory position of a man holding the dual offices of Surveyor and Inspector of Nuisances. He does not hesitate to affirm that where this condition prevails proper sanitary adminstration cannot be carried out.

SANITATION OF COW-BYRES.

In his tenth annual report Dr. Nasmyth, the Medical Officer for the County of Fife, makes certain suggestions which have become necessary through recent legislation, and by the new Dairy Order of 1899. The additions to the regulations adopted in 1897 he would strongly recommend are :—

(1) Separate and distinct arrangements for the cleansing and scalding of dairy utensils apart from the domestic washing arrangements, so as to exclude the possibility of infected clothing being brought into contact with dairy utensils and milk supply.

(2) Provisions for lighting. This should not be a mere abstract suggestion, but should be a concrete quantity. It is now well recognised that light is as necessary for the health of cows as it is for human beings. It is not a faddist's theory. Mr. Speir, of Newton Farm, an authority on dairying and a practical dairyman, advises that there should be two square feet for every cow.

(3) Provisions for ventilation. These should also be definite and specified, so many square inches for inlet and so many for outlet per cow. Four square inches for each would be a fair allowance. This could be effected by having an ordinary six-inch drain pipe through the wall at the cow's head, sloping upwards. The expenses of this would be very small, and provided these were kept open and not closed with wisps of straw, the question of a large cubic air space would be of less consequence. The proviso, however, is absolute. Outlets should be provided at the ridge in the same proportion. Mr. Speir, in his most valuable suggestions, emphasises these points we all are at one about, viz.:— Impermeable floors, cement in preference ; cement dados 6ft. high round the byres ; ample use of lime-wash above the dados. Mr. Speir further advises as a most important point, the construction of the gutter behind the cows, which should be 2ft. wide, 6in. deep next the cow, and 4in. next the footway, with a fall of half an inch longitudinally for each cow, and half an inch laterally in the gutter to the footway.

NOTES AND QUERIES.

Subscribers may obtain advice on matters appertaining to Public Health Law and Municipal and Sanitary Engineering. Letters should be addressed "Notes and Queries," The Sanitary Record, 5, Fetter-lane, London, E.C. If an answer be required immediately, a stamped addressed envelope must be enclosed

2198.—Sewage Disposal Scheme for Hospital.—"W. S." writes :—"In my district we are at the present time well forward with the reconstruction of an infectious diseases hospital. The institution stands within an enclosed area of 2½ acres, upon rising ground, and will, when finished, accommodate about forty people. The disposal of sewage is a somewhat difficult problem. Hitherto a cesspool has been used, but as the overflow sometimes gets into a stream which runs close by, the method of sewage disposal must be improved. An intimation of the best and most practical system of sewage treatment for the institution in question by some of your readers or yourself will be deemed a favour."

Answer.—The sewage may be treated on bacteria beds, coarse and fine, and with or without previous treatment in a detritus tank, or it may be treated by a septic tank and subsequently on bacteria beds. The querist should obtain Thudichum's "Bacterial Methods of Sewage Purification," price 1s. 3d. ; Martin's "Purification of Sewage by Bacteria," price 6½d. ; and Adam's "Local Government Board's Requirements as to Sewage Schemes," price 2s. 6d., obtainable from the office of this journal, post free at the prices named, from which he should be able to decide upon a satisfactory scheme for the purification of the sewage of the hospital.

2199.—Cleansing Houses of Persons in Receipt of Parish Relief.—"Assistant" writes :—"With reference to your answer to query 2171, page 373, in which you advise that the Relieving Officer should defray the cost of cleansing the houses of infirm persons in receipt of parish relief, and who are unable to do the work themselves, or that the Local Authority might do the work and charge the cost to the rates. May I ask if notice could not legally be served on the owner compelling him to limewash ?"

Answer.—There is no doubt that the Local Authority may serve notice upon the owner to limewash the premises, &c., either under Sec. 46 of the Act of 1875, or under Sec. 5 of the Infectious Disease (Prevention) Act, 1890, and we were fully aware of this when we wrote our former reply. But the owner would be entitled to object to such a notice, and could, in our opinion, successfully defend the Authority's requirements. It would, moreover, in our opinion, be unreasonable to cast the duty, under the circumstances in question, upon the owner, as he is not in default.

2200.—Quantities : Book on for Road-making and Sewer Construction.—"Surveyor" writes :—"I should be glad if you could advise me of a good book on taking out quantities, preparing bills and measuring for work on road-making and sewer construction."

Answer.—The querist will find Bartlett's "Quantities : Road-making and Sewer Construction for the use of Surveyors, Municipal Engineers, &c.," price 7s. 6d., the book he requires. By its aid every Surveyor should be enabled to get out quantities, &c., in a methodical and trustworthy manner. The book may be obtained from the Sanitary Publishing Company, 5, Fetter-lane, London, E.C., post free at the published price.

2201.—Street Watering and Dust Carts : Opinions Required. — "Surveyor" writes : — "Will any Municipal Engineer give his experience in watering streets by means of a perforated pipe laid along each kerb line ? Is there any better method of watering than by a water cart ? What is the usual form of dust cart for any street sweepings ? As the querist is at the Antipodes, full information is asked for."

Answer.—We invite the opinion of Municipal Engineers to the question, and shall be glad to publish their communications. Our advice to any engineer who contemplates recommending any such system as the laying of perforated pipes alongside the kerb is "Don't." The system has been tried in one or two places and was found very unsatisfactory, and the cost prohibitive. No system has been found so satisfactory as the employment of a water van drawn by a horse or motor. The ordinary "tip cart" with high sides, and provided with a tarpaulin, or light metal cover, to prevent the dust from being blown off the cart, is in most favour, and is to be generally recommended. Messrs. Wm. Glover and Sons, Limited, Warwick, makers of water vans and dust carts, will, on application, send the querist their illustrated lists of carts, vans, &c., used by municipal bodies. We also advise the querist to obtain Boulnois' "Municipal and Sanitary Engineers' Hand-book," price 15s., and Maxwell's "Removal and Disposal of Town Refuse," price 15s., post free from the office of this journal at the prices named. Cardew's "Australian Municipal Pocket-book of Engineering for the Use of Laymen" will also be found useful.

2202.—Ventilation of Sewers by Electric Light Standards. —"M. G." writes :—"I should be glad to have your opinion as to the practicability of the idea which has occurred to me of ventilating public sewers by means of electric light standards where such exist alongside highways, and as to whether it is worth patenting. I enclose sketch.

Answer.—The system of ventilating sewers by isolated iron standards, such as lamp columns, iron ventilating shafts such as those manufactured by Messrs. Ham, Baker, and Co., shown in our advertising pages every week, is an old one and at the same time a good one. But in the sketch submitted by the querist there is nothing original, and consequently nothing to patent, and we could not advise the querist to spend any money in the endeavour to obtain a patent.

2203.—Tuberculosis in Animals : Book Recommended.— "G. W." writes :—"What is meant by pseudo-tuberculosis ? In what part of the carcase would you look for evidence of the disease ? Would the carcase of an animal so affected be fit for food ?"

Answer.—The querist should obtain Vacher's "Food Inspector's Handbook," price 3s. 6d., post free from the Sanitary Publishing Company, 5, Fetter-lane, London, E.C., from which the desired information may be obtained.

2204.—Testing House Drains by Private Request.—"Another Inspector" writes :—"The answer to Query 2183, in your issue of May 2nd, is definite so far as it goes ; but should a person, either in writing or verbally, state that his house is in an unsanitary condition, *i.e.*, that there is a bad smell in the house would an Inspector be bound to test if he was morally certain that the premises were in a sanitary condition ? I have not overlooked the General Orders."

Answer.—An Inspector would not be justified in refusing to

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inspect a dwelling-house after receiving a complaint as to the existence of a nuisance therein on such grounds as being "morally certain" that the premises are in a sanitary condition. His duty, as prescribed by the General Orders of the Local Government Board of the 23rd March, 1891, relating to the duties of an Inspector of Nuisances, is—"On receiving notice of the existence of any nuisance, to visit the spot as early as practicable and inquire into such alleged nuisance." Neither an owner nor an occupier is enabled to demand from, or dictate to, the Inspector that he shall test the drains of any house. The determination as to whether it is necessary to test the drains by the smoke, chemical, or hydraulic test is one which is in the absolute discretion of the Inspector. If there is any reason to suspect that the drainage is imperfect, the Inspector would be guilty of dereliction of duty if he failed to take such steps as were necessary to discover the defects, and to do this the drains should be tested in an approved and skilful manner. A vigilant Inspector will always, while on duty, carry in his pocket one or more of Kingzett's drain testers, as manufactured by the Sanitas Company, Limited, and make a preliminary test of a drain by inserting one of these therein, from the use of which a reliable index can be formed of its soundness or otherwise. He should subsequently, if any defect is noticeable, locate the defect by the use of the smoke machine. We always advise that the drainage of all houses wherein a case of infectious disease has occurred be thoroughly tested with the smoke machine.

2205.—Female Sanitary Inspectorships: How to Qualify For.—"M. D." writes:—"Will you allow me to point out a slight error in your reply to 'K. B.,' Query 2194 (page 438), May 16th. You tell your querist that 'she should obtain by examination the certificate of the Sanitary Institute for Sanitary Inspectors.' The Institute only *trains* candidates for the office of Sanitary Inspector; its certificate does not qualify for the office. 'K. B.' must obtain the certificate of the Sanitary Inspectors' Examination Board, concerning which and the course of training precedent to examination she can obtain information from the honorary secretary of the Board, No. 1 Adelaide-buildings, London Bridge, E.C."

Answer.—We are obliged to our esteemed correspondent for his communication. He is, however, under a misapprehension, and has confused the examination held by the Sanitary Inspectors' Examination Board, whose certificate is required for candidates for an inspectorship in London, and where it is alone recognised at present, as applying to provincial Inspectors also. Our former answer had reference to provincial Inspectors based on the requirements of the querist, and was quite correct. The certificate of the Sanitary Institute is practically the only certificate recognised by Sanitary Authorities outside the metropolis, as a reference to their advertisements for Inspectors will show. This certificate is, moreover, distinctly a certificate of competency of the examinee that he is qualified to discharge the duties of an Inspector of Nuisances, and our correspondent is also in error in stating that such certificate does not qualify for the office, and that the Sanitary Institute only trains candidates for the office. The Sanitary Inspectors' Examination Board do not conduct examinations for Sanitary Inspectors under the Public Health Act, 1875, but only under the Public Health (London) Act, 1891.

2206.—Building Bye-laws: Return Wall.—"Surveyor" writes: "In a plan submitted to an Urban Authority, a party wall is shown 9in. in thickness and 30ft. in length. This party wall has a return wall of the full thickness toothed into it. Does this comply with the bye-laws as to lateral support?"

Answer.—The return wall, so far as we can determine, is carried up to the top of the topmost storey. If this be the case, the plan complies with the bye-laws.

2207.—Building Plans Deposited for Approval Copied by a Councillor.—"R. J." writes: "Has a Councillor the right to take tracings of plans submitted to the Council by architects and builders, and if tracings are taken, has the owner of the plans any power in the matter?"

Answer.—A Councillor has no right to take such tracings. His conduct is highly improper. The plans are not the property of the Council to permit such a licence being taken. But how does the Councillor obtain access to the plans? The Surveyor should refuse him permission to do so while they are in his possession without the authority of his Council, and the latter are not enabled to give such authority without committing a serious breach of trust. Any architect, &c., aggrieved should communicate with the Local Government Board.

2208.—Officer's Duties: Whether Entitled to Extra Payment.—"C. S. I." writes:—"I had occasion some time ago to summon two persons for non-compliance with notice to abate nuisances on their premises. The Medical Officer of Health was called to give evidence, and we got a conviction. Can the Medical Officer of Health charge for giving evidence in Court, seeing that he is paid by the Authority a fixed salary? I may say that he is a part-time official."

Answer.—As to whether the Medical Officer is entitled to payment from the Local Authority for attending the police-court to give evidence, this will depend upon the terms of his appointment. Unless it is specially provided that he is to be so paid we do not think that he will be entitled to charge a fee for attendance. If, however, his fees are allowed by the magistrates in awarding costs he will be entitled to receive such.

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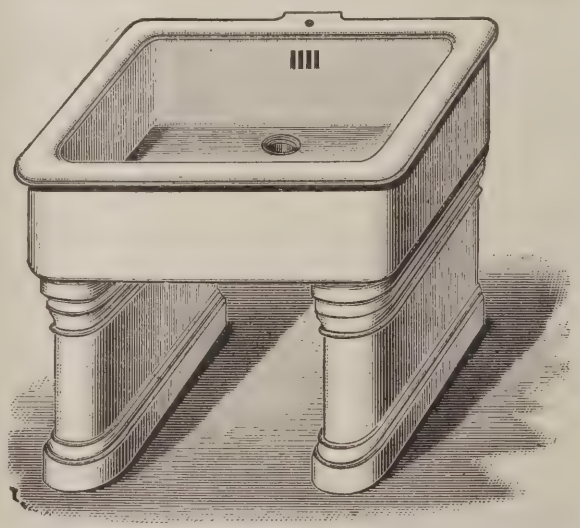

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INFECTIOUS DISEASES, DISINFECTION, VENTILATION.

By W. Arnold Evans, M.D., Medical Officer of Health, Bradford.

The following is the second of a series of ten lectures to Sanitary Officers and others, organised by a Joint Committee of the West Riding County Council, and the County Boroughs of Leeds, Bradford, Huddersfield, and Halifax, along with the Yorkshire College and the Sanitary Institute.

The lecture was delivered at the Philosophical Hall, Leeds, before a large audience of some 300 Sanitary Inspectors and others. Councillor E. E. Lawson, Chairman of the Leeds Sanitary Committee, occupied the chair, and introduced the lecturer, who spoke as follows, illustrating his remarks by numerous lantern slides :—

Mr. Chairman, Ladies and Gentlemen:

Although the first part of my lecture is entitled "Infectious Diseases," it is not my intention to speak of all those diseases which we know to be infective in their nature. To do this in the time we have at our disposal this afternoon would be impossible. Most of my remarks will be devoted to the consideration of those duties which are to be carried out by the Sanitary Inspector, in reference to infectious diseases scheduled under the "Infectious Diseases" Notification Act, or to any other concerning which he may receive instructions from his Medical Officer of Health.

Now, it is a matter of common knowledge that the onset of an attack of most of the commonly recognised infectious diseases is characterised by "fever," *i.e.*, a rise in the bodily temperature. The person attacked is the subject of several uncomfortable symptoms, and the temperature of his body is raised. In health the temperature of the body is about 98·5 Fah., and any rise over this figure constitutes a condition of "fever," which state of body being common to almost all the infectious diseases had led to the application of the word "fever" as a sufficient description of such disorders. Hence the two expressions "fever" and "infectious diseases" are commonly regarded as synonymous.

The first stage in the course of a fever is the *infection* or the time at which the germ of the disease enters the body. In some cases this epoch can be definitely fixed; when, for instance, a person has visited a friend or relative known to be suffering from small-pox, and in about fourteen days afterwards sickens of the disease. In most cases, however, the time of infection is not found without further and sometimes laborious inquiry. The manner in which the infective germ has gained access to the body varies considerably; infection may take place through an abrasion of the skin as in erysipelas, or by means of the lungs as in typhus fever, or by means of food or water, *e.g.*, enteric fever or cholera. But although a person may receive the germs of fever into his system, it does not necessarily follow that he will suffer from an attack of the disorder commonly produced by such infection. In the subsequent changes taking place in the organs of the body in which the infection has been received, or in the blood, the germs may undergo disintegration, and produce no untoward result. If, however, the germs gain the mastery, and produce an attack of the disease, the characteristic symptoms do not show themselves at once. The period between the date of infection and the onset of the disease is called the period of "incubation," and varies considerably in different diseases. In some of the fevers, the period of incubation varies within narrow limits, *e.g.*, small-pox, which has an incubation period of about fourteen days; for out of about 2000 cases of small-pox which at one time or another have come under my notice, I have not known the incubation period to be less than twelve or more than fifteen days. In other disorders the incubation period may vary within wide limits, *e.g.*, enteric fever, in which it is usually about a fortnight, but may vary from a few days to three weeks. For a reason to which I shall presently refer, it is important to know as accurately as possible the incubation period of those affections against which we wish to adopt measures of prevention.

Well, the incubation period having been completed, we next come to the onset of the disorder, which in most cases is sudden, and marked by a rise of temperature and other symptoms such as shiverings, convulsions, or a sore throat and enlargement of glands. In some instances, however, the onset is insidious, the patient being scarcely able to fix the day upon which his illness commenced, and can only say that he has been ailing more or less for a week or so; such is commonly given as the history of the onset in a case of enteric fever. The fever subsequently passes through two more stages, which we shall call the *height* and the *decline* of the fever; during the first of these the temperature remains high, but may last only a few hours, as in the case of pneumonia, or a considerably longer period, as in some cases of enteric fever; the decline of the fever may be sudden, when ailment is said to end by crisis, as in typhus fever, or of long duration, when it is said to end by lysis, *e.g.*, typhoid fever. But even now the end of the illness is not reached, for there is the period of convalescence to follow, which may be of short or long duration; in fact, in some diseases, such as influenza, great prostration and mental depression may follow, the patient may not make a complete recovery for eighteen months or two years.

The most common infectious diseases with which you are likely to be brought into contact are those scheduled in the Infectious Disease Notification Act, viz., scarlet fever, diphtheria, cholera, small-pox, erysipelas, puerperal fever, relapsing continued typhus, and enteric fever. In addition to these I must add tuberculosis, for we now know that this disease is spread by infection, and that certain preventive measures may be taken to control it. There is also another disease which has lately invaded some of the British ports, viz., *plague*, and although it has not so far succeeded in gaining a foothold in this country, it seems to have permanently established itself in India and South Africa, so that Inspectors of Port Sanitary Authorities should be on their guard in reference to suspicious cases of disease occurring on board ships from these places.

I will now touch as briefly as I can upon the various diseases included in the list that I have given to you.

Scarlet fever.—In scarlet fever the incubation period varies from one to seven days, but it is usually about two or three. Cases of this disease are not infrequently overlooked, owing to the fact that some are extremely mild and no doctor has to be in attendance; so that in making your inquiry as to the cause it is well to remember that the case reported may not be the first one in the district, consequently you should inquire if any other children in the vicinity have been laid up with a sore throat, or are mixing with other children when their skin is in a peeling condition. Scarlet fever is sometimes spread by means of milk; in fact, an infected milk supply is a well-known cause of a sudden epidemic; it may, therefore, become your duty to make a careful investigation of the surroundings of the dairy from which the milk is derived, and of any source from which the milk may have been supplied. In order to prevent the spread of the disease it is necessary to insist upon isolation of the patient, and if this cannot be carried out at home removal to the fever hospital should be effected.

Sometimes the disease is spread by infected per-

sons attending a particular school, and if it be found impossible to exclude from school attendance the actual offenders, it may be necessary to close the school, more especially in the country, where the school is probably the only place where the children meet. After recovery and disinfection of the premises a period of quarantine should by imposed, during which the other persons in the house should be kept under observation and not allowed to attend school. In my practice I fix this period of quarantine at seven days, which I think is little enough.

Diphtheria.—This disease, which some years ago was chiefly confined to country districts, is now exceedingly common in the towns, and in two of the largest county boroughs in Yorkshire has of late become rife. Why this should be so is difficult to explain. The incubation period is somewhat uncertain, and ranges between two days and a week. It is one of those diseases which, like scarlet fever, is liable to escape detection when mild, and to be considered as nothing more than an ordinary sore throat. So that in making your inquiry it is necessary to ascertain the school attendance, and find out whether many children are away from a similar cause. Many cases of apparently slight sore throat are true cases of diphtheria and spread the disease widely.

It may be spread by milk, so that the same inquiry must be made as in the case of scarlet fever. You should also carefully inspect the drainage, for not a few outbursts of diphtheria have been attributed to bad drainage. It is well, if possible, to have cases of diphtheria isolated in hospital, particularly if there be any children in the infected house. The quarantine period is twelve days.

Enteric fever.—The incubation period of enteric fever varies from a few days to three weeks, but is usually about a fortnight. The three matters to which you should give special attention in your inspection as to an outbreak of this disease are water, milk, and drainage, and latterly a not infrequent source of infection has been discovered in shellfish which have been fed in sewage polluted waters. In country districts the water is the most common cause of enteric fever; a spring or small watercourse fouled with the excreta from any person suffering from typhoid fever will cause a sudden and serious outbreak amongst those who take the water, *e.g.*, Kildwick outbreak. Typhoid fever is one of those diseases which are spread chiefly by negligence on the part of those responsible for the destruction of the excreta from a sick person. You must insist upon the greatest care being taken as to the disposal of both liquid and solid excreta of a person suffering from enteric fever; directly the stools are passed they should be placed in disinfectants, and the utmost cleanliness must be observed by persons brought into contact with the infected person. The ultimate disposal of the excreta is a matter of great importance. If there is a water-closet in the house they should be put into it after preliminary disinfection, and so disposed of. Should there only be a privy midden, I think it would be safer to bury the typhoid dejecta. Natural disinfection takes place in the earth, and provided the noxious material is not so buried as to pollute some water supply, no harm is done. On no account leave the excreta from a person suffering from enteric about the premises, but let it be disposed of quickly; the dried material from typhoid patients is the potent source of infection.

Typhus fever.—The incubation period of this disease varies from three or four days to three weeks; but for practical purposes you may consider it to be about twelve days. With the exception of an occasional outburst in some of the squalid districts of a great city, typhus fever is now seldom heard of; and in those cities, *e.g.*, Liverpool, Dublin, and Edinburgh, where it used to be common, it has now become much less so. The cause of this disorder is overcrowding and destitution. You will generally find that this kind of case occurs in a filthy house; and if you happen to see it amongst the members of a clean and well-ordered family, the great probability is that such people have been infected by personal contact with the filthy. Under insanitary conditions typhus fever is exceedingly infectious, but cases isolated in a well-ventilated and well-lighted hospital ward do not frequently infect persons who are engaged to attend them. Should cases of this kind come under your notice, you should take means to have them isolated in a hospital; and considering the class of people amongst which such cases occur, you will scarcely have any difficulty in effecting their removal. Should, however, treatment be undertaken at home, the principal consideration is free ventilation. It is difficult to lay down a rule as to when the period of infection is over, so that in fixing the period of quarantine you must be guided by medical advice.

Small-pox.—The period of incubation varies between twelve and fifteen days. When inquiring into a case of small-pox, you must remember that the disease does not arise out of ordinary filth conditions, as epidemic diarrhœa does, but that each case of small-pox arises from some pre-existing case, and that the infection has been conveyed by some infected person or thing. You should inquire as to whether any other suspicious case has been heard of in the yard or court; find out where the infected person has lately been visiting; if his work takes him away from home, or whether he has had visitors from an infected town. All these points are very important. The means that you should adopt to prevent the spread of the disease are (1) the isolation of the case in hospital, and there is usually no difficulty about this. (2) Disinfection of the premises. (3) Keep under observation for not less than eighteen days all those who have been in contact with the infected person, and should you find any of them sicken, report the matter at once to the Medical Officer. (4) Persuade all persons in the house and all "contact" to be vaccinated or re-vaccinated, as the case may be, at once. The person is free from infection directly all the scabs have fallen from his skin.

Measles and whooping-cough.—Although not often included in the list of notifiable diseases, these two complaints are responsible for more deaths than are caused by all the other diseases of which I have spoken. It is commonly thought by a large number of people that all children must at some time or other have an attack of measles and whooping-cough, and that the sooner they get it over the better. Nothing could be further from the truth, and if more care were exercised in separating the sick from the healthy I feel sure that these diseases would not be so common. They are difficult to deal with because they are so very infectious in their early stages; if, however, the first cases in a district can be secured and isolated, and measures of disinfection thoroughly carried out, the spread of the disease can sometimes be arrested, but in many instances it is found necessary to close a school, particularly if the pupils are very young children. Cases of measles or whooping-cough should not be considered to be free from infection for at least a month from the date of onset, and not then if any cough remain.

Tuberculosis.—Since the discovery of the micro-organism of tuberculosis, by Professor Koch in 1884, it has become more evident year after year that this disease must be included in the list of infectious disease in spite of the fact that the Local Government Board refuse their sanction to the inclusion of its most common form, viz., phthisis or consumption of the lungs, in the list of diseases of the Infectious Diseases Notification Act. Some towns have adopted a voluntary system of notification of this disease with good results. In view

of the fact that the sputa or other discharges from a person suffering from phthisis contain the living germs of the disease in abundance, it is necessary that some precaution should be taken to avoid the indiscriminate distribution of this infective matter. If the person be able to follow his employment he should use one of those portable spit cups in preference to a pocket-handkerchief, and by no means expectorate on the floor. Should, however, the case be one of advanced phthisis, the surroundings of the infected person should be chosen as carefully as his circumstances will permit; his room should be so situate as to admit of a large amount of direct sunlight, and free ventilation should be encouraged wherever possible. Any one in the early stage of phthisis should be sent to a sanatorium for the open-air treatment, not merely for the sake of isolation, but to secure the benefit of this method of treatment. Unfortunately in this country these institutions are neither numerous nor cheap, but the efforts now made by County Councils and other Public Authorities for establishing more give promise for a better state of things in the future.

Plague.—Another disease that I am bound to mention is the plague. In consequence of the commerce of this country being world-wide there has occurred already in several of the ports an outbreak of plague, but the effort of the Port Sanitary Authorities has, so far, been equal to the task of suppressing it. It is not my intention to give you a clinical description of a case, but only to point out that the more insanitary the condition of any town into which it may be introduced the greater is the difficulty of getting rid of it. I will merely mention the case of Bombay, where the disease seems to have permanently established itself, and of Cape Town, which is apparently attaining the same unenviable position.

We may now consider the manner in which infectious diseases are spread. There used to be a popular distinction between diseases that were contagious, *i.e.*, spread by personal contact, and those that were infectious, *i.e.*, conveyed through the air without any personal contact. In this sense, as pointed out by a recent writer, "small-pox would be called an infectious, and anthrax a contagious disease; for the former is usually conveyed through the air, and the latter by infected articles. But small-pox can infect by direct contact, as in the old preventive treatment of variolation, and anthrax may be conveyed by the air, as in some forms of wool-sorters' disease." The distinction between "infection" and "contagion" thus breaks down, and perhaps we had better give it up altogether. Nevertheless we must not lose sight of the fact that some diseases are generally conveyed through the air, and others by direct or indirect contact.

It is acknowledged by all that diseases of the infective order are produced by micro-organisms, and that for each disease there exists a specific microbe, although in some diseases it may not have been discovered. The methods by which such organisms enter the body are:—

(1) *Pulmonary infection.*—The bacilli, or spores, are inspired with the breath, and enter the body through the delicate mucous lining of the lungs; as instances of this method of infection I may name diphtheria, influenza, and the pulmonary form of tuberculosis.

(2) *Intestinal infection.*—In which the organisms are swallowed with food, dust, or water, *e.g.*, cholera, enteric fever.

(3) *Inoculation* through a wounded or unwounded surface of the skin, as in the case of erysipelas, hydrophobia, or anthrax.

(4) *Infection by means* of infected articles in which the manner of entrance of the virus into the body is not precisely understood, *e.g.*, leprosy and pneumonia.

Now, since micro-organisms are carried through the air, and so infect at a considerable distance, it is important that infected articles, *e.g.*, soiled linen, should not be allowed to become dry until they have been disinfected. All soiled blankets, &c., which have been in contact with a person suffering from an infectious disease, whether in a private house or a hospital should be placed in a tank of disinfectant solution and kept there till washed. The cholera bacillus, however, when deprived of moisture, rapidly dies, so that this disease is not transmitted through the air.

(To be continued.)

SANITARY DANGERS IN FLATS AND TENEMENT HOUSES.

Some remarks under this heading occur in the annual report of Dr. Clothier, Medical Officer of Health for Hornsey. He says:—"Unless great care is taken in seeing that proper air space, both back and front, is given, and no overcrowding allowed, this altered style of building will tend to become a danger to the public health. The object of this style of house is to admit of the crowding of more people into the same, or even less, cubic space than has hitherto been considered necessary, and this of itself, if carried beyond a certain point, constitutes a public danger, more particularly as regards infectious, tuberculous, and respiratory diseases. Overcrowding may apply to blocks of houses being too near each other—that is to say, not having sufficient air space between them—to houses having too many tenements, and to rooms being too small for the number of persons living in them. As regards these tenement houses, some have been newly erected, some are situated over shops, and others are the result of alterations of houses already built, the alteration always consisting in making so-called separate provision for more families than could be accommodated before the alteration. . . In these smaller houses the sanitary arrangements are quite distinct, and the dust-bins can be kept outside in the gardens or back courts. In houses containing, however, more than two tenements, the dust-bins are not always kept outside, as should be the case, and, in fact, in some of these houses no proper place has been provided for the bins, which are either placed in the houses or passages, and thus constitute a nuisance. There is one advantage which these tenement houses have, and that is that the sanitary dust-bins provided must be small, and consequently have to be frequently emptied. The very fact, however, which necessitates their being small, namely, because they have often to be carried through the houses and down the common stairs, may in itself constitute a bad nuisance in the shape of smells being given off whilst the bins are being carried down and emptied. Another feature in some of these houses not to be recommended is the fact that the larders are not ventilated from the outside, but open directly into the kitchens. A larder so situated is not a proper place in which to put milk, fruit, and vegetables, especially during the hot weather. . . . One point which will have to be considered is the course of action to be adopted on the outbreak of dangerous infectious disease in a tenement house. It is quite certain that susceptible people living in such a house will stand a much greater chance of catching the disease than if they lived in entirely separate houses, and this points to the greater necessity of isolating first cases as soon as possible, which can only be effectively done by removal to hospital. Another very serious question arises, namely:—Supposing that for some reason or other the patient be not removed, but isolated so far as can be done at home, is the tenement where the patient lives, or the whole house to be considered infectious, and are children who live in the other tenements, and have very probably been in contact with the patient, to be excluded from school as well as those living in the tenement where the disease actually exists?

INSANITARY BAKERIES IN INDIA.

A REPORT by Major R. H. Firth, late Sanitary Officer Rawal Pindi district (now Professor of Hygiene at the Army Medical School, Netley), deals, among other matters, with insanitary bakeries. His remarks are sufficiently interesting to be reproduced in detail. The bakeries, he says, may be divided into three groups, (*a*) those belonging to the commissariat, (*b*) those owned by Europeans, and (*c*) those owned by natives in the bazaars. The first named supply all ration bread. I have inspected all these bakeries in the district, and found little to criticise, beyond the quality of the flour. This, at times, has been somewhat indifferent, notably in the Murree hills during the autumn of 1899, when samples were examined by me from Kalabagh and found to be extremely faulty. As a result of my representations, that stock of flour was destroyed.

The chief complaint against commissariat bread, especially in the hot season, is that it is unduly acid or sour. This depends partly on the use of dirty flour or the access of dust to a flour originally clean, and partly to difficulties dependent on temperature, whereby fermentation proceeds too rapidly or too far. In the Government bakeries I have invariably found all kneading troughs and ferment clean. The ferment, or so-called yeast, used in the commissariat bakeries has been repeatedly examined and found free from objection. It is made by adding one pound of crushed malt to a hot infusion of hops. The malt comes from the Murree brewery and the hops from Kashmir. I am inclined to think that this ferment tends to make a rather dark and somewhat bitter bread.

The second class of bakeries, or the private ones owned and managed by Europeans, are limited in number and practically exist only in Rawal Pindi. As a rule they are well kept and present no grave sanitary objections, except that they all employ the native process for obtaining a ferment. Under the supervision of managers like Ahrens and Cumper, the risks attending the preparation of this leaven in these private bakeries is reduced to a minimum, and the bakeries themselves and the bread turned out beyond criticism.

The third class of bakeries are all owned by natives and invariably situated in the bazaars. Without exception they are dark, dismal hovels, having no other air vent than the door. If by chance a window does exist this is invariably occluded by rags or canvas. Nearly all the work is done and the storage accommodation placed on the floor.

These native bakeries have a sanitary importance in that they as a class are the chief source of supply of the many cakes and buns so much in demand among the younger soldiers. Further, to a large extent, the various coffee shops, temperance rooms, regimental and religious institutes, such as "homes" and prayer rooms, are supplied with bread and cakes from bakeries of this kind. In this district there are certain notable exceptions; thus the Sussex Regiment at Sialkot has its own bakery in the lines, so have the 4th Dragoon Guards at Pindi. Both are quite clean and satisfactory. The contract baker to the latter regiment is also baker to the Somerset Light Infantry. In all these bakeries, whether in lines or not, the leaven, or "khamir," employed is prepared after the native method, and not such as is used in the commissariat bakeries out here or in the bakeries at home. Yeast, by this I mean true yeast, is unknown among bakers in this district, at least it is never used.

In the above-mentioned native process for obtaining a leaven the active agent is sour butter milk. The procedure is simple. A certain amount of this sour butter milk is mixed with flour, and to that is added a small quantity of "massala." The whole is tied up in a rag and placed in a warm dark corner of the bakery, often stowed away on a rafter in the roof. Twelve to fifteen hours suffice to secure active fermentation of the mass, which now constitutes the baker's stock of so-called yeast, or "khamir," or ferment. A portion of this is next worked up with flour into a dough, which is the equivalent of the English baker's "sponge," and from this again the "dough" or final article is made. The theory underlying the English and native methods is identical, the difference lies merely in the source of the ferment; in one it is either the yeast plant or the organic ferment present in malt, in the other it is from the cold but much decomposed and acid butter milk. The addition of "massala," to which the native baker attaches so much importance and mystery, is merely a relic of trade superstition. The composition of this "massala" is regarded by most native bakers as a trade secret. From my inquiries I find that the following constituents enter into the composition of most bakers' "massala":—Gum mastiche, myrrh, powdered cloves, powdered nutmegs, coriander seed, cardamoms, saffron, cinnamon, powdered liquorice root, seeds of the lotus, pop corns or parched maize, and a kind of coarse meerschaum which comes from the sea coast and called *samunder sukh*. Except as a means of introducing saprophytic organisms, if not worse, to the mixture of flour and sour butter milk, these ingredients of the "massala" play no important part in the leavening process.

As to the butter milk I have examined many samples. The same is invariably to be found in a small earthenware ghurra, stuck away in some out-of-the-way corner. Bacteriologically, these samples defy description, for they usually are nothing but a mass of saprophytic organisms. I have never isolated either the B. typhosus or the cholera vibrio from any of these samples, but on two occasions have readily obtained B. coli and once the B. enteriditis sporogenes. Having regard to the primary origin in most cases of this sour and fermenting butter milk from any casual bazaar or village source, and to its subsequent storage and treatment in dirty houses, it requires no technical knowledge to appreciate the possibilities of evil from this pivot on which the whole bazaar baker's business works.

I am not disposed to lay undue stress on the unsatisfactory nature of this "khamir" of the native bakeries, nor do I think that there is any sound evidence forthcoming that any serious disease results to the troops from its employment. But, what I wish to emphasise is the need of the greatest scrutiny and supervision of this material. To many officers its employment and nature is quite unknown. My experience goes to show that the better class native bakers and those holding contracts with corps, are fully alive to the need of care in the selection of the source from whence they get this sour milk. Of course they realise nothing of the reasons why it should be obtained only from the purest of milk; still they try, I think, to get it from sanitary sources. It will be a very difficult matter to get these men to discard it, and there is no denying that in good hands and under sanitary conditions, this native-made leaven produces a whiter looking and sweeter tasting bread than that made with the leaven or so-called yeast of the commissariat bakeries.

Another question in respect of insanitary bakeries has interested me. It is this: What is the possible effect of using foul or dirty ingredients in bread making upon the bread or cake consumer? Many are inclined to think that, however filthy the bakery, however contaminated the flour or the ingredients of the leaven or dough may be, all will be right by the mere process of baking in an oven which destroys those organisms now recognised as lying at the root of most diseased conditions. This question arose some time ago in England, and certain investigations by Drs. Waldo and Walsh indicated that the contention that baking sterilises the loaf or cake rests on mere assumption. As the conditions which per-

tain in an Indian bakery are peculiar and differ materially from those in England, I instituted a series of experiments to elucidate the question raised.

There are obviously two ways in which a loaf may convey specific disease organisms to the consumer, viz.: —(1) By organisms lodging on the crust from contamination in the bakery or in transit; (2) by organisms which possibly escape destruction inside the loaf during baking.

The possibilities of contaminating the crust during storage or transit are too patent. The remedy must be either by elaborate precautions which are impracticable, or re-sterilisation of the crust by putting in a hot oven for a short while before use. This is a refinement quite beyond ordinary routine.

The possibility of the survival of organisms in the interior of a baked loaf or cake is more complex and involves a consideration of temperature. From a series of experiments made by myself, I find that the average maximum temperature in the middle of an ordinary Indian loaf when baked in the common oven of an Indian bakery varies from 84 deg. Cent. to 95 deg. Cent. The loaf does not remain more than 40 min. in the oven, and the increase of temperature from an average initial point of 25 deg. Cent. averages 7 deg. for each 10 min. of time, so that the maximum temperature of from 84 deg. Cent. to 95 deg. Cent. is only reached and maintained in the last few minutes of the loaf's stay in the oven, and that for the first 40 min. the maximum temperature inside the loaf is not more than 50 deg. Cent. Few bacteria and their spores are destroyed by an exposure to the above-mentioned temperatures, and on theoretical grounds it is safe to assume that bacteria and their spores are not necessarily destroyed inside a loaf by baking. So much for theory, now for facts.

To obtain facts, a series of gelatine tubes were seeded direct from loaves as these left the oven by removing a small piece of bread from the centre of the loaf with a sterilised knife, rapidly crumbling the piece up and dropping the *débris* into the tube of liquefied gelatine; from these, plates were set. In this manner, twenty-three loaves were examined from different places, and in all seventeen distinct varieties of bacteria and moulds were found, none, however, being pathogenic organisms.

These results clearly showed that it is possible for organisms to survive even the process of baking, though the number of positive results is smaller than I expected. As a control, I artificially infected a dough mass with a fresh culture of M. prodigiosus, which by reason of its colour is readily recognised. From this dough two loaves were moulded, and then baked in the usual way. Of ten cultures set from each, one group yielded 3, 0, 0, 1, 0, 4, 2, 0, 0, and 1, the other 0, 0, 0, 0, 2, 0, 1, 3, 0, 0, colonies of M. prodigiosus.

I have spent much time over this inquiry, as it appeared to me of great practical importance. Without doubting that the conditions in the centre of most loaves are such that the greater number of organisms present in the unbaked mass are destroyed, still the fact that certain non-pathogenic organisms or their spores can be demonstrated as capable of surviving the baking process in the centre of an ordinary loaf, suggests the argument by analogy that pathogenic bacteria or their spores may also safely survive, and that they do so is extremely probable.

The new refuse destructor, which has been erected on a site contiguous to the electric light works in Moss-lane, Morecambe, has been opened, and is now running for testing purposes—a month being allowed for this purpose. The contract price was £5000, and the contractors are Messrs. Stirling and Hughes, Liverpool. With the aid of the destructor additional power will be secured for generating electric current, and a motor will be worked in addition.

SWEEPING UP THE MICROBES.

Mr. Elmer W. Firth, a Fellow of Columbia University, has been granted the degree of Doctor of Philosophy because he has proved the common ordinary broom to be a great menace to the public health. Mr. Firth followed the trial of the broom all over Greater New York, and found that its use whisks up into the air countless millions of microbes which otherwise would lie quietly on the ground out of the reach of the human being. Armed with a machine for collecting the germs, Mr. Firth went into court-rooms, school-rooms, churches, railway trains, horse cars, ferry-boats, &c., and procured samples of the air in each, in most cases before and after sweeping.

These samples of air he took home to his laboratory and under the microscope he counted the germs. The result was, to say the least, remarkable, and points a significant moral in the matter of public sanitation. For instance, on a single fibre one and a-half inches long, taken from the cocoa matting of a train, Mr. Firth counted nearly two million bacteria. It was an inner fibre, however. On an outer fibre, which had long been exposed to the feet of the multitude, there were found between three and four million germs.

In an ordinary room previous to sweeping the investigator found an average of 600 germs per cubic metre; after dry sweeping he found an average of 18,000 germs per cubic metre, showing that sweeping increased the number of bacteria by 30 times. In a well-known church, from which Mr. Firth obtained specimens of air while the building was being "dusted," he estimated the number of micro-organisms flying through a cubic metre of air (that is, a little over a cubic yard) to be 18,139. That was the number he obtained in his cultures. Twelve hours later, when the dust had settled, his samples of air showed only 5857 organisms per cubic metre, or less than one-third the number.

The apparatus for obtaining specimens of air was concealed in a handbag, so that Mr. Firth was enabled to sit in an "L" train, or horse car, or even in church, and procure certain measured portions of the atmosphere without his near neighbour being at all aware of the fact. In the satchel was a metal cylinder, from which the air had been exhausted. This cylinder had attached to it a gauge and two stopcocks. One of the stops held a small "sand-filter." This filter stuck through a hole cut in the handbag. To secure some microbe-laden air Mr. Firth had merely to reach down and turn on the stopcock. Immediately the air rushed in through the filter, the amount of air rushing through being determined by the gauge. When a cubic metre, more or less, had been secured, the stop was cut off, the organisms having meanwhile collected in the filter. When sufficient evidence of micro-organisms had been secured, Mr. Firth made a report to the College of Physicians and Surgeons of New York. Some of his conclusions were startling.

He says carpets should be abolished from theatres, churches, and court-rooms: fibre mats should be prohibited from cars and boats; non-absorbent flooring should be used in all public places; dry sweeping should not be allowed in the presence of numbers of persons; damp cloths and wet sawdust should only be used in cleaning houses and public buildings, because the latter are settling basins for microbe-laden dust; no attempt should be made to conceal dust and dirt, as is the aim of certain absorbent floor materials now commonly used, and disinfection should not be substituted for the removal of accumulated dirt.

"Numerous investigations," says Mr. Firth, "have demonstrated the presence of micro-organisms in the air everywhere and under all conditions, except over the open sea, on mountain summits, and in the Polar regions; but they are found in greatest numbers in the

vicinity of large cities, and especially where poor hygienic conditions prevail. The occurrence of bacteria in air, however, is only temporary, owing to the greater specific gravity of the organisms or of the dust particles to which they may be attached. They are foreign to air, for the reason that this medium does not afford them enough moisture and organic nutriment; but some species may retain their vitality under such unfavourable conditions for many days or even weeks, as proved by certain experiments on the communication of infectious diseases through the air.

"In many factories and workshops cleanliness receives only secondary consideration, except where dust and dirt are known to have a damaging effect on the product manufactured. At one brass-polishing establishment, where dirty windows and poor light make it necessary for workmen to hold the metal close to the eye in order to examine the surface, I was told by an employé that three out of ten of the men employed had died of consumption within a year. The extensive trade in old rags and waste paper affords opportunity for communicating disease, and these materials are frequently handled even within the living-rooms of those that deal in them. Ulric in a rag-sorting room found two million to four million organisms per cubic metre of air.

"Dust-free air in buildings and conveyances is to be secured only by complete removal of all dirt and dust from surfaces which may be disturbed during occupation."

SOME DIFFICULTIES AFFECTING THE HOUSING PROBLEM IN BOROUGHS.

By J. H. Garratt, M.D., Medical Officer of Health, Borough of Cheltenham.

The difficulties in regard to habitation under which the poorest large families live are great. When sickness overtakes any member the conditions at once become terrible to contemplate. The houses of these large poor families are nearly always very dirty. These families occupy the small places in which they are found on account of the comparative lowness of the rent. If they went into a house which would accommodate them well, decently, and hygienically, it would cost half the income of the family to pay the rent. With reference to the division into rooms of the smallest houses I have sometimes observed that downstairs the house is divided into a little kitchen and a little front parlour. The latter being the depository of a few pathetic nick-nacks, is shut up as a sort of *sanctum sanctorum*, being only opened in all its unaired fustiness upon the rare advent of a grand visitor. It would be much better for the health and comfort of the inmates for only one good living-room to be provided in the house, instead of dividing the space as above mentioned. Where there is a little parlour downstairs, and a large family occupies the house, the room should be furnished for an additional bedroom. Sentiment, and the little pardonable pride of the wife to have a private room, generally prevents the parlour being used as a bedroom, and the space is practically lost to the house.

Generally speaking, when a man betters his position, the first thing he thinks of doing is to go into a better house; but he cannot go there until he can pay the rent. The need of going into a larger house, however, is more and more accentuated as a man becomes less and less able to do it. The larger the family grows the less rent can be afforded, and it must often happen that the reason of a family being in low water lies in some incapacity or lack of health or constitution, the only help for which lies in a better mode of living, and a better place in which to live. And how are these things to be provided? The answer to this question is the crux of the consideration. How are people who cannot pay the current rate of rental to be provided with convenient and healthy homes? It is the worst and least capable part of the populace that occupy the worst houses. This part constitutes a large class numerically. The members of this class are the worst tenants; they pay their rent irregularly; they earn irregularly. Some are naturally idle, some dissolute, some ill, some lacking in natural wit and capacity. This is the part of the populace upon which it is necessary to fix the mind in dealing with the question of the housing of the poor. It is the most unprofitable class. Inasmuch as this class is never likely to be dealt with by private enterprise, because private enterprise requires to be well paid; if any help come to it, it will come at the hands of the public, that is the public governing bodies. It is much too large and intricate a matter to be effectively dealt with by the private efforts of charitable individuals.

How can governing Coporations proceed in the matter? If they build houses with money borrowed at the greatest advantage, some to accommodate families of about eight or more persons, and some smaller, and fix the rentals at the lowest price they can afford, they will be able to supply houses of a class and convenience that cannot otherwise be got at so low a rent. These being offered for letting will instantly be taken by superior artisans and others who are earning a fair wage, and who on the whole are well able to take care of themselves. Thus a class will be benefited for whose benefit there is no urgent call. If the Corporations continue to build, they will sooner or later affect the readiness with which the other houses are let and bring down their rents, and then will begin a competition as between cheaper rents on the one hand and better houses on the other. Ultimately it may be hoped that the poorest class for whose benefit the movement was started, will get into houses a grade better than before. It is not sure that they will move at all unless the cheapest houses are compulsorily closed, or the people forced out of them. A number of persons who before paid 2s. 6d. a week for a wretched place will otherwise be inclined to stay on at 1s. 9d. When the overcrowding does not exceed the limit of 300 cubic feet of sleeping space per adult person a family cannot be forced out of a house on that score at present.

Any more direct method of re-housing the poorest of the poor is beset with the greatest difficulties. It would be a most invidious and even impossible task to pick out those that most required to be benefited. Sanitary considerations would be overwhelmed by friendly sentiment and unequal estimates of moral worth, and the worst, for whom the greatest benefits are theoretically required, would be rebuffed and offended and neglected. Human nature, and even human charity, are full of unwarranted prejudices. There are further complications in the possible ill-effect upon independence. There are many idle persons ready to lean upon any support. There are many others ready to take any unfair advantage, and in order to obtain benefits will make pretences of being worse off than they are.

Thus it is easy for Sanitary Authorities to adopt Part III. of the Housing of the Working Classes Act. It is easy for candidates for the Municipal Council to talk about improving the dwellings of the poor. But when you examine the question closely the way is obstructed, as it were, by a tangle of thorns and briars. The temper in which the matter is being treated shows a great advance in Socialistic thought, but from whatever source the idea comes of improving the dwellings of the poor, it must be practicable. The question to be answered and proved is whether the proposition for ruling bodies to provide houses for the poor be practicable; whether, in fact, the housing of the poorest can be considered apart from the raising of the standard of their moral, mental, and physical condition generally. It is a very large question and a very complex one. The whole result of public interference in providing houses for the poor seems impossible to estimate. Yet

before entering upon such a business one should know what result one is aiming at, and be able to clearly estimate the effects of one's action. It would appear as if action were being taken in some places before these points have been made plain.

ANNUAL REPORTS.

Chester (Port Sanitary Authority).—In his report for 1900, the Medical Officer of this Authority (Dr. J. Humphry Williams, Flint) states that the nature and amount of the trade carried on in the river (Dee) is much the same as previously, the foreign trade showing some diminution. During the year no notification was received, and no sickness was reported on board. The hospital at Mostyn was always ready for the immediate reception of patients, and this, together with the readiness of the Chester Fever Hospital to receive any fever patients, made the district well prepared for the appearance of any infectious cases. During the twelve months the total number of ships inspected at the five ports of Connah's Quay, Rhyl, Mostyn, Saltney, Chester, and Hawarden Bridge was 554 (nine foreign and 545 English), carrying crews amounting to 2062 men.

Deeside.—In his annual report on the sanitary condition of the Deeside district, Mr. William Anderson, Aboyne, the Sanitary Inspector, states that during the year small extensions were made to the Aboyne and Torphins special drainage and water districts. These were rendered necessary by the erection of new houses, and with a view of providing for the requirements of others which were likely to be erected on feuing ground situated within the area of both special districts. These villages are growing rapidly, and the supply of houses during the summer and autumn months was, as a rule, not equal to the demand. A considerable number of drainage and water supplies outwith special districts had been dealt with during the year. In a number of cases new supplies had been provided, while old ones had been greatly improved by structural alterations. These works had all been executed with the view of preventing pollution or contamination, and also with the view of having a proper supply of wholesome water at or within a reasonable distance of every dwelling house. Slaughter-houses were, speaking generally, fairly well attended to, and no breach of the bye-laws had been made. The schools were also in a fair sanitary condition, but the privies and urinals in connection with some of them were of a very primitive description and far behind the requirements of modern sanitation. Factories and workshops were in a fair sanitary condition; ventilation, lime-washing, and general cleanliness were well attended to. Alterations and improvements were made on four which were complained about. There were seven registered dairies in the district, and the lime-washing and general cleanliness were fairly well attended to, and also the health of the cows, which was a very important matter, as it was impossible for an unhealthy cow to produce healthy milk, and on the quality of the food supplied to the cow the quality of the milk largely depended.

Edinburgh.—In the third annual report of the Sanitary and Markets Departments of the city of Edinburgh, Dr. Williamson states that the attention of the department had, as usual, been largely devoted to the introduction of sanitary appliances, so as to render the houses so treated free from those common recurring forms of nuisance which abound in all cases in which any laxity was allowed to exist. In no fewer than 35 instances there was found an entire absence of water-closet accommodation for the occupants of inhabited dwellings, which deficiencies were at once rectified. In nearly 350 cases the existing apparatus was found to be so defective as to give rise to complaint and to become an element of danger. In nearly 200 instances insanitary apartments had been treated, with highly satisfactory results so far as ventilation was concerned. During the year 2000 complaints as to the non-sweeping and washing of common stairs had been dealt with, which had taxed the energy of the staff to the fullest extent. The duty which devolved upon tenants of keeping their houses in a cleanly condition had been strictly enforced, and in nearly 1600 instances had it been necessary to ensure that such work was satisfactorily carried out. The question of overcrowding continued to occupy a large share of constant work and supervision, and during the year 350 cases had been dealt with. In 219 of these, it was satisfactory to report, successful efforts had been made, while 130 known cases of overcrowding were at present occupying the attention of the department. Under the powers conferred by the Public Health (Scotland) Act, it had been necessary to take action in regard to certain businesses and trades of an offensive nature. The burden of having open spaces asphalted or cemented should be laid upon the proprietors. In such a condition these would be more suitable as playgrounds, and would not form such harbours for decomposing refuse as the majority of them do in their present condition. Throughout the city there were at least 335 open spaces which required constant supervision. The number of proprietors responsible for such varied from seven to twenty, and the number of tenants whose houses overlooked such spaces amounted in some instances to 100. Dr. Williamson submits that such facts should emphasise the desirability of an almost daily cleansing, and should further emphasise the great difficulty in having this accomplished in which so many proprietors and tenants are involved.

Gosport.—The annual report of the Gosport Medical Officer of Health has just been issued. Dr. Hunter states that there has been a considerable diminution in the death-rate as compared with 1899, though the number exceeds somewhat the average of the preceding five years. There have been 823 births during the year, of which 426 were males and 397 females. The number of deaths recorded was 606 for the whole district, or 50 less than last year. The death-rate for the whole district is 20·89 per thousand, whilst for the district proper, that is excluding the naval and military population, it is 19·28 per thousand. Infantile mortality is, says Dr. Hunter, much higher than it ought to be, and were ordinary precautions taken by those having the care of infants a great saving of life would necessarily result. Of a total of 606 children under the age of one year 135 died, the mortality rate being 164·03 per thousand births registered. This, however, is a slightly better record than in 1899, when the percentage was 183·7. Dr. Hunter requests that the earnest consideration of the Sanitary Authority should be given to the matter. The number of cases of infectious diseases notified was 261. Scarlet fever was much less prevalent than in 1899, when 251 cases were notified, as compared with 77 in 1800. Enteric fever, however, rose considerably above the average, there being 148 notifications as against 125. Diphtheria and erysipelas both showed diminution. The number of deaths from notifiable diseases numbered 39, as against 48, the mortality rate being 1·38 per thousand.

Lichfield.—Dr. James Clark has issued his thirteenth annual report as Medical Officer of Health for the city. He records that last year the birth-rate was 27·5 as against 28·9 for the kingdom, and that the death-rate was 21·6 as against 18·3 for the whole country. The

death-rate was higher than any other year since 1892, and 3·3 higher than the average of England and Wales. Zymotic diseases caused a very unusual number of deaths, comprising two from measles, 11 from whooping-cough, one from diphtheria, one from typhoid fever, and three from diarrhœa; total 18. This gave a rate of 2·3 per thousand, and was the highest recorded within his experience. In all 28 cases of infectious disease were reported, two of diphtheria, three of typhoid fever, 14 of scarlet fever, and nine of erysipelas, and for the first time since its establishment deaths had taken place in the isolation hospital. Up to the end of 1899 there had been 211 patients admitted from the urban and rural districts to the hospital without any deaths. During 1900, 34 more patients had been admitted, and two from the rural district had died. As bearing upon the sanitary condition of the city, Mr. W. Chovil, Inspector of Nuisances, reports:—"I have made an inspection of the city, and repeated my inspection very frequently in those parts of the city occupied by the poor. Much has been done to improve the tenements, but the structural defects continue, wihch is a source of danger to the health of the tenants. The want of ventilation and personal cleanliness, with proper facilities for light, is absent. I have been successful in effecting improvements in some of the cottages. Overcrowding continues a danger to the health of the people. The lack of suitable cottage accommodation is very much felt by the poor. I have frequently moved them from one tenement, and after a few days found them in another part of the city, living in an overcrowded state." Summing up his observations, Dr. Clark says:—"Although there has been some advance made in the removal of insanitary conditions during the year ended, I would supplement your Inspector's report by again urging upon you the great necessity that exists of a more regular system for the removal, or the more effective dealing with house and ash-pit refuse. Water-carriage being the best and most suitable system of disposal, old and foul privies should be abolished and water-closets of modern construction substituted, and the other sanitary and structural defects mentioned should be forcibly urged upon the attention of property owners with a view to their more prompt correction. These matters have been brought under your notice in former reports, and I again press them on your consideration."

Smethwick.—In his annual report for the borough of Smethwick, the Medical Officer of Health (Mr. W. F. Marsh Jackson) writes:—The general zymotic and infantile death-rates compare most favourably with those of previous years. The marriage-rate is, I am glad to note, higher than it has been for the last two years, but there is a falling off in the birth-rate. In 1892 and 1894 a similar falling off occurred. These variations in the birth-rate are probably due to accidental causes inherent to a working class population, which is more or less migratory. It is a fact, and as such it must be accepted. I may, however, say that the marriage-rate was lower than usual during the two years preceding 1900. Still, although this falling off of the birth-rate has occurred, the rate compares favourably with that of all England. The population has undergone a further increase. I assumed at the beginning of the year under notice that on the 30th June it would be 65,700. Supposing this conclusion to be correct, an increase of population over 1899 of 4200 is shown. The number of marriages that have taken place during the year is 415, and the marriage-rate for this period is 14·9 per 1000 persons living per annum. The number of births registered during the year was 1859—986 males, 873 females, exceeding the number registered in 1899 by 3 only. The birth-rate for the year under notice is 33·3 per 1000 persons living per annum, against 36·03 per 1000 in 1899. The deaths registered number 872, against 780 in 1899, comprising 454 males and 418 females. The death-rate for the year is 15·6 per 1000 persons living per annum, against 15·1 per 1000 in 1899.

St. Ives.—Dr. Nicholls, in his report for 1900 to St. Ives Town Council, stated that there were 193 births (males 51, females 64). The birth-rate per 1000 was 31·67, against 34·62 in 1899, and the death-rate 18·87, against 15·75 in 1899. The deaths included 36 under one year, 22 over 65 years, 12 over 80, and 1 over 90. Four of the deaths were visitors, seven deaths were from zymotic diseases, including four diphtheria and two diarrhœa; six (five females and a male) were from cancer; eight from phthisis, and three from influenza. Deaths from respiratory diseases had been more numerous, 10 being infants. There were 21 deaths at all ages. The infant mortality was at the rate of 186 deaths to 1000 births—a high rate, but chiefly increased by deaths from bronchitis in February and April. Many of these infants suffered from malnutrition and bad feeding. No epidemic sickness occurred. During the year 49 cases of infectious diseases were notified, a rate of 8·04 per 1000. A great improvement was manifest in the lower portion of the town, resulting from the increased facilities for refuse collecting, by which twice as much work is done. Thirty-four new buildings had been certified fit for occupation. The water supply was good, and fairly met the extending requirements of the town. In his general remarks the Medical Officer says the year has not on the whole been unfavourable. The birth-rate was a very good average, but none too good considering the leakage through infant mortality. The increase in the respiratory death-rate was, he could not help thinking, in many cases due to, or in part caused by, influenza, although the evidence may not have been sufficient to certify this as the cause of death.

SCHOOL SLATES AND DIPHTHERIA.

The suggestion that the indiscriminate interchange of school slates among school children may result in the spread of diphtheria has been made, and no doubt the danger is a real one. The slates are all wetted and washed in the same bucket, and if they should get dry during the school session, of course the spitting comes in again. Her Majesty's Inspectors condemn the practice of children spitting on their slates and wiping them with their caps. Still, the custom lives. To reduce this danger the following suggestion has been made. Every child on its entry into the school should be supplied with a suitable slate, and its name marked on it on both sides. The child would occupy the same place in the class and always have the same slate; or, if removed to some other part of the class, carry its slate with it. Slates falling out of use from children leaving, &c., might be washed in some suitable disinfectant before being re-issued.

It is questionable, however, whether any system of reserving slates and pencils to particular scholars or of repeated and efficient disinfection is practicable. Pencil and paper have taken the place of the slate in some schools, and this innovation has everything to recommend it. One would like to see it adopted in the London Board Schools.

Mr. Pandeli Ralli has given £1000 for the erection of a new ward to the Cranleigh Cottage Hospital in memory of his sister; and towards the erection of a second additional ward Lord Alverstone, Lord Ashcombe, Mr. Healey, and Mr. Waller have given £100 each, and Mrs. Barnard Hanney and Miss Summer £50 each.

THE SEVEN-PLACE DECIMAL.

In the course of a review of Col. Moore's "New Tables," a writer in last week's *Engineer* "lets himself go" on the matter of decimals. As a clever piece of writing it is worthy of a high place in the ranks of journalism. How far its exquisite satire is applicable to the denizens of the office of the municipal engineer, we leave our readers to judge for themselves. The writer says:—

The devotion of the professional part of the human engineering race to formula and long rows of figures is a profoundly mysterious and pathetic psychological phenomenon. The longer one ponders it, the more deeply is one convinced that there are certain fundamental ingredients in human nature that remain unchanged throughout the æons. One of these is the imperative need of the human mind to worship what it does not understand, and what it has no use for. For many a long century stocks and stones satisfied this mental necessity in the elementary form which it took in the babyhood of mankind. The stocks and stones were hewn and chipped into very angular and ragged shapes, and were worshipped with more and more blind and abject reverence the uglier and bonier they grew. They grew very ugly and very bony indeed, and men who mingled piety with a far-sighted and calculating prudence found it profitable to imitate them in personal angularity by reducing their bodily frames to emaciated skeletons. These men justified and supported this bony existence by help of astrological and other runic complex calculations which pretended to wrest secrets from the heart of Nature, but which were based upon not a shadow of a trace of a relation with the true living nerve and muscle of Nature's physiology. When at last they were found out, men could not worship them any longer, and had to search for more modern stocks and stones. China led the way in giving up the emaciation business, for which it had gone in heavily in its earlier history, but to this day it maintains the runic astrology as a strong political and social force. European nations in the past century found it necessary to invent new forms of meaningless and therefore mysterious numbered diagrams. The latest and most improved, up-to-date, and go-ahead fetish is the most subtle and most powerful of all the generations of all the fetishes. He is the Algebraic Formula and the Seven-Place Decimal. Everybody has implicit faith in the Algebraic Formula, because nobody understands him. Not being able to trip him, or to cut him up, or to tear him in pieces, they stand in fear and awesome trembling before him, and let him have his way. He rules in all the designing offices without question or hindrance, and poor Nature, asking for only a little attention and consideration, slinks away unheeded. And when he blossoms out and matures in the fruit of Seven-Place Decimals, men bow down in reverence before him and subscribe share capital, and ask only for a moderate percentage of their capital to be repaid to them in dividends. Most men are modest, and take care to leave him alone.

It is touching to observe the pious attitude of the professional engineer in his behaviour towards the Seven-Place Decimal. The first rite to be performed is, of course, to pay his guinea for his fifteen millions of printed figures which are to help him to tell the Public Works Committee whether the new sewer is to be 3ft. or 3½ft. in diameter. The payment of the guinea produces a glow of holy satisfaction and content. Then, if there be no pressing call at the telephone, he turns over the pages of the tables in awe-stricken dreamy admiration of the endless maze of S.P.D.'s rising tier upon tier in giddy columns *de profundis ad astra*, and stretching left and right from $-\infty$ to $+\infty$. Somehow they always seem to average in O, but this is only the effect of the daze upon the eyesight. The third rite to be performed is quiet contemplation of the shelves and pious consideration of in which place they —it, he, the fetish, the S.P.D.—would look best. The place is chosen, and the Tables are laid up in it. They lie there. They are taken down once every two years, to see that the S.P.D.—*Spiritus Pontificus Divinus*—is still there all right in his pristine glory and magnificence, and has not shrivelled into any semblance of common sense; also in order to wipe the dust off. From his quiet resting place upon the shelves, the Spirit is breathed throughout the office, and pervades the minds of engineers, without noise or effort, with potent inactivity. It is enough that he is there; he penetrates without pushing; he dominates without energy or the possibility of a germ of energy arising within him.

CHINESE PREJUDICE IN SANITARY MATTERS.

By Arthur Stanley, M.D., &c., Health Office, Shanghai.

In China considerable breadth of view and treatment is necesssary in hygienic measures. With an unsympathetic people like the Chinese, sweeping sanitary measures are difficult of operation, and though hygienic conversion is hard, dragooning is still less effective, and any attempt to hustle the East is poorly rewarded. The process of social evolution can perhaps be studied on broader lines in China than anywhere on account of its particularly massive and concrete historical records, and the lesson taught appears to be, that in many respects the methods of some centuries of practical experience are frequently confirmed as good by modern science. And it is by following out these methods in a spirit of scientific sympathy, tempered by an accurate appreciation of Asiatic environment, that the best results may be obtained. Although in sanitary matters action is sometimes taken *ultra vires*, it is essential the principle be maintained that in relation to public health the power of the Municipal Council is supreme. In dealing with Asiatics a little wholesome despotism is good, and in matters of life and death it is the duty of the Government to govern.

In its bearing on the attitude of the Chinese to modern public health measures, it may be noted that the prejudices of the Chinese against Western medicine are still strong. The Chinese are a people with a supporting belief in all kinds of drug charms and spells, and their medical methods are strictly empirical and mostly founded on the fancies of the alchemistical religion of Tao. The Chinese drugshops contain an immense number of drugs and preparations, are the most elaborately ornamental of all shops, and the Chinaman spends a large part of his income on medicines. It is not surprising, therefore, that public health measures, which are founded on organised common sense, and from which the personal factor of the relation between doctor and patient, with all its fallacies, is eliminated, do not appeal acutely to the Chinaman. He is attracted only by the merest scum of so-called Western civilisation furnished by well-advertised "patent medicines" and itinerant quacks. As in diseases the least curable there are the greater number of drugs recommended as cures, so it is with the Chinese, who, though ignorant of the real cause of disease, have a proportionately great desire for a multitude of drugs—the Chinese pharmacopœia is the largest in the world.

The Stockton Urban District Council has authorised the Medical Officer of Health to attend the annual Congress of the Institute of Public Health to be held at Bournemouth from the 25th to 30th July.

SANITARY INSPECTORS' EXAMINATION BOARD.

An examination for Sanitary Inspectors under the Public Health (London) Act, 1891, was held in May, 1901. The following is a list of the candidates who passed in the above examination, with the names of the Institutions at which the candidates received instruction :—

Name of candidate.	Name of Institution.
Miss J. Agnew	Sanitary Institute.
Miss E. I. Beeston	Sanitary Institute.
Miss A. E. T. Biggs	National Health Society.
Mr. J. L. Clark	Liverpool School of Hygiene.
Mr. T. W. Dee	King's College.
Mrs. T. Fisher	National Health Society.
Miss M. F. Hoe	Sanitary Institute.
Miss Anne Hutchinson	National Health Society.
Mr. E. J. Manders	University College, Cardiff.
Miss E. C. Martin	King's College.
Miss F. Potter	National Health Society.
Mr. T. Robinson	Liverpool School of Hygiene.
Miss M. Stampa	National Health Society.
Mr. S. W. Wingfield	King's College.

SHOULD PULMONARY TUBERCULOSIS BE NOTIFIED? *

By Dr. W. C. Chapman, Member State Board of Health, Toledo.

The subject of this paper, "Should Pulmonary Tuberculosis be Notified?" whilst more particularly one to be discussed by Health Authorities and physicians, appeals so closely to the sentimentality of the people, it is well to include them as interested hearers when considering the desirability of adopting measures to carry out such plans.

Before speaking specifically of "tuberculosis," it may be asked, Why should any disease be reported to the health officials? Is there sufficient benefit derived from the knowledge that infectious disease exists in a neighbourhood to repay for time and money spent in obtaining such information? And what can be rightly expected as a result of attempts made to prevent the spread of such disease by the boards of health?

Experience has shown that certain diseases are highly contagious, that they are easily communicable from one person to another, and that the only way whereby the spreading of infection can be overcome is by the enforcement of strict rules of isolation. If it were possible for attending physicians to see to the details of this work, and to institute sanitary measures, which include environment, then the health officer would become an almost useless personage. The diagnosis of the case has been made by the attendant, and rarely does the health department find occasion to reverse such diagnosis. Unless difference of opinion arises among local physicians, the occasion scarcely ever occurs in which such department should act, other than as an executive body charged with the enforcement of law. As an expert because of great experience, the health officer may be called to decide as to the disease under treatment, but then only in the presence of the attending physician, and most frequently at his request. All isolation regulations should be controlled by the Health Authorities, and they should have, as they do in this State, full power to enforce them. Tracing the local cause for disease is one of the duties of the sanitary officer, and many an epidemic has been stayed by scientific, and therefore laborious investigation. The discovery of the polluted well, or stream of water, amply repays for all expenditure. It is therefore to be expected that well-directed, systematic effort, will minimise the dangers from contagious or infectious diseases.

* A paper read at the eleventh annual meeting of the Ohio State Board of Health, 1901.

Having demonstrated that diseases classed as contagious may be combated by modern methods, and communities freed from epidemic influence, there is no objection upon the part of anyone to the enforcement of restrictive measures. It is only when the contagious nature of a disease is questioned that opposition comes. The public is sure that scarlet fever, measles, diphtheria, and like diseases, are contagious, and therefore willingly submit to reasonable control; but taking the one under consideration, consumption, its contagiousness is not so apparent. When doctors disagree, why should not the laity?

The question is asked, Is consumption a communicable disease? Does it attack the well-nourished, and therefore healthy? Otherwise, can the specific tubercular germ be implanted in a normal being, then developing and destroying until death ends all? It requires years of teaching to overthrow early belief, and only a few years have passed since all were taught that consumption was a hereditary curse handed down from ancestry. Those who could look backward upon a family history without taint would remain free from the disease. Insurance companies confirmed this belief, as they do to-day. The family history of consumption prevents the issuance of a policy. Believing, as most investigators do, that the tubercular germ may be conveyed through the air and implanted in proper soil in any lung, it is not possible to consider the disease other than a contagious one. Differing from others, in that it is one which develops slowly, and cannot be communicated to a healthy person, there must be primarily a lesion before implantation of the specific germ is possible. A lengthy, close relationship, as sleeping in the same bed, or occupying common apartments, nursing the afflicted one, or otherwise remaining in close contact, may after a time convey the disease, but never does it pass through a definite prodromic stage, and in an abrupt development quickly manifest its presence.

In attempting to arrive at a satisfactory conclusion in regard to the matter of reporting cases of comsumption, the question comes, Why should they be reported? Being a chronic disease, easily recognised by the attending physician, and so far only amenable to hygienic and restorative treatment, without specific medication, what benefit can be obtained by the patient from the intervention of the health officials? The answer is, nothing. What may be expected in the way of preventing friends and attendants from becoming infected with the disease? Here the answer is the same, almost nothing. The few rules to be followed in the care of sputa and other excretions are so simple, that they scarcely need mentioning. There can be but one benefit that can accrue to anyone, and that is the obtaining of statistics, so that comparative tables may be prepared and the ratio of recoveries to death may be obtained. It is known that tuberculous patients have frequently recovered. The proportion is not tabulated, but could be determined with considerable accuracy if all cases were known to the Authorities. Boards of health may investigate residential surroundings, and advise as to sanitary regulations of the home, but this action would be resented by the physician, and might prevent the intended good. There must also be a great change in the sentiment of the people before they will agree to be separated from the loved ones dying of lingering disease. They will consent to the removal from home by the advice of the family physician, but are unwilling to obey the unsolicited advice of an officer. There seems to be a rising and almost insurmountable obstacle to the enforcement of rules in regard to the supervision of consumptive cases by the officer of health, and that is the prejudice of the physicians. A very conservative body of educated men see no adequate reason for troubling themselves to make reports of their tuberculosis cases. If any benefit could be proven, acquiescence might be prompt. If such a positive preventive procedure as vaccination against

small-pox is ignored, or strongly objected to, by quite a large percentage of physicians and people, how can it be expected that they will permit of the quarantining of consumptives? Care must be taken that health boards and health officials do not undertake to rapidly and radically assume authority. There seems to be rising all over the world a sentiment that certain men are endeavouring to force opinions which have never been proven, by close investigation, to be correct. A notable example of this feeling is shown by a translated article in the *Lancet and Clinic*, December 29th, and a quotation may be considered to the point. The article is from the pen of Dr. A. Lutaud, editor of the *Journal of Medicine*, of Paris:—"The mania to legislate on the matters of medicine and hygiene, derived from England and Germany, has now developed in France. Not only are laws made more or less oppressive to the liberty of the people, but even against the rights of the physician himself. That which startles is the fact that such legislation is established at the instance of individuals belonging to our own medical corporation. It is certainly not the general practitioner, those who gain a living honourably and by hard labour in the exercise of the medical profession, who have asked for the passage of such enactments against personal liberty and added restriction to the art of healing; the latter know full well the dangers of contagion."

Much follows this quotation, most of it being an attack upon modern serum medication, it is an exaggerated statement of well known procedures that have often benefited mankind. This article is mentioned merely because it shows that opposition will come in the house of supposed friends; but it also shows that the profession and the laity are not willing to advance rapidly in adopting new procedures.

A warning note is given by our friend, the editor of the same publication, December 15th. "It is recognised," says he, "that the police power of the State and municipality is, to all intents and purposes, almost unlimited. It is this absolute power of the State over the citizen that makes it possible for the boards of health and health officers to enact arbitrary regulations, which are an offence that is quite intolerable."

In concluding this paper, in view of opposition by the profession and the laity, and because of only slight benefits to be derived by the public and the profession, it seems advisable that pulmonary tuberculosis should not be notified, as other contagious diseases, to the Health Authorities.

PUBLIC HEALTH IN THE DAYS OF MOSES.

In the domain of public hygiene we find most wonderful evidence of the great genius of the greatest legislator of all times and his prophetic anticipation of many of the discoveries of modern science of medicine and hygiene. The preservation of forest, disposal of excreta, vital statistics, notification of infectious diseases, sanitary inspection, isolation, diagnostication of contagious diseases, quarantine, fumigation and disinfection, all these terms seem to read like titles of chapters in a modern text book on hygiene, but are nevertheless mentioned in the Pentateuch and were made by Moses part of his system of sanitation for his chosen people.

In Book 5, ch. xx., vs. 19 and 20, we read: "When thou shalt besiege a city, &c., thou shalt not destroy the trees thereof, for thou mayst eat of them, and thou shalt not cut them down, for the tree of the field is man's life"; here we see that Moses has recognised the value of vegetable life and the preservation of trees in their relation to the sanitary environment of the people. In the same book, ch. xxiii., vs. 12 and 13, we find a very wise rule for the disposal of excreta in camps. Every camp had to have a special place outside its boundary where the people were compelled to go to, and, especially for this purpose, made paddles on their weapons to dig and cover with earth their excrementitious matter.

In Book 4, ch. xvi., we read: "Now they that died of the plague were 14,700," it is evident, therefore, that Moses had some system of vital statistics, else the number of those who died would not have been known.

There are many speculations and commentaries on what was meant by "Zoraath" and leprosy mentioned so many times in the Bible, but it is conceded by all who studied the matter that those diseases mentioned by Moses were epidemic, contagious, and infectious, and the laws in regard to them, with a view to prevent their spread and keep them within bound, are certainly remarkable in their thoroughness as well as anticipation of discoveries of modern science. Chapter xiii. of Leviticus is a very definite and detailed section of infectious diseases. "When a man shall have in the skin of his flesh a rising, a scab, or bright spot, &c., then he shall be brought unto the priest," here we, as well as in the latter expression, "he shall come and tell the priest," find the rudiments of compulsory notification of contagious diseases. And the priest shall "look and behold." Here the duty of diagnostician is imposed upon the priest, who is the spiritual as well as health officer. Should, however, the priest not be able to determine the nature of the disease, or even if he should be in doubt, then "the priest shall shut him up for seven days." Here we find the principle of temporary isolation. When after isolation the disease is finally diagnosticated as an infectious one, then the one infected was pronounced unclean, and "all days wherein the plague shall be in him he shall be defiled, he is unclean, he shall dwell alone, without the camp shall his habitation be." After recovery and quarantine of the infected, we find a whole procedure for disinfection for the patient and his clothes as well. "And he that is to be cleansed shall wash his clothes, shave off all his hair, and he shall wash his clothes, also his flesh, in water, and he shall be clean," not, however, before a disinfection with a mixture of "cedar wood, hyssop and scarlet," a phenol group of that period.

The system of sanitation of Moses embraces not only man and his clothing, but also the house. In the same chapter quoted we find quite an interesting section on house inspection, &c.: "And he that owneth the house shall come and tell the priest" (it seems then that the duty of complaining and notifying was imposed upon the owner of the house), saying: "it seemeth to me there is, as it were, a plague in the house." Then the priest shall go and see the house (not, however, before the house is emptied by its inhabitants), and behold, "if the plague be spread on the walls of the house, then the priest shall cause the house to be scraped within round about, and they shall pour out the dust that they scrape off without the city into an unclean place." But, if after this procedure, the house is still unclean, then the priest "shall break down the house, the stones thereof, &c." Quite a radical measure, the extent of which is limited even in our most modern sanitary legislation.

THE INSTITUTE OF SANITARY ENGINEERS

(Incorporated).

OFFICIAL TRANSACTIONS.

The following meetings will be held at the new offices 19, Bloomsbury-square, W.C., on Wednesday, June 12th, 1901.

General Purposes and Finance Committee at 4.0 p.m.
Half-yearly General Meeting at 7.0 p.m.

It is reported that Mr. J. P. Morgan, the American millionaire, is paying for the cost of the installation of the electric light in St. Paul's Cathedral.

NOTICES.

ANNUAL SUBSCRIPTIONS.—The Annual Subscription to "THE SANITARY RECORD," for the United Kingdom, paid in advance, is 12s. 6d. For the Colonies and Abroad, 15s This includes postage, and a Copy of the Diary, post free.

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The Sanitary Record

AND

Journal of Sanitary and Municipal Engineering.

MAY 30, 1901.

SANITARY SCIENCE AND LONGEVITY.

THE writer of a recent article in the *Scotsman* draws some instructive comparisons from an analysis of the figures in the report of the Registrar-General for Scotland for 1900, as illustrative of the changes in the length of life during the last seventeen years. The figures dealt with by the writer are those for the eight principal towns of Scotland, which may probably be taken as exhibiting in the most marked degree the operation on human life of the advance of modern sanitation. In the country, with its greater slowness to receive and apply sanitary ideas, the change can hardly be expected to be so clearly marked. The years brought under notice for purposes of comparison are 1883, 1898, and 1900. From an examination of the figures for these years, the proportion per cent. of the deaths at each age—from birth to five, from five to twenty, from twenty to sixty, and over sixty—to the total number of deaths, is explicitly brought out as follows :—

In 1883, up to the age of five the death-rate was 41·1; in 1898, 39·7; and in 1900, 36·2. From the age of five to twenty the rate was for the three years respectively 10·4, 7·3, and 7·1; from twenty to sixty, 30·1, 32·0, and 33·5; over sixty, 18·4, 21·0, and 23·2; the total death-rate per cent. for the three years being 2·0240, 1·8447, and 1·9070.

The most striking feature of these statistics is that in the early ages of life, and more particularly in the case of young children, there has been a progressive decrease in the ratio of mortality to the total mortality; or, in other words, the chance of life for the young has been steadily on the increase. That this is due to greater care for the young, owing to a more widespread attention to observance of the laws of health, there can be little doubt, and the statistical evidence of the fact is most satisfactory. On the other hand, when we pass to the ages over twenty, we find an increase in the percentages, which, however, is but the natural consequence of the preservation during early years of many of those lives which would at a former period have succumbed in the struggle for existence. To a certain extent, therefore, the advance of sanitary science would seem to bring about a revolution in the Darwinian law of "the survival of the fittest." Reduced to percentages, the difference between 1883 and 1900 works out as follows :—Between birth and five years of age, the increased immunity from fatal disease is equal to 11·9 per cent.; between five and twenty, the increase is even larger, viz., 31·7 per cent.; while between twenty and sixty, the augmentation in the mortality ratio to the total deaths is represented by 11·2 per cent.; and over sixty by 26·09 per cent. From another set of comparisons of the years in question, as illustrating the mean age of death, we have the following results :—In 1883 the mean age was 27·2; in 1898, 29·4; and in 1900, 31·4; representing a mean increase in life between 1883 and 1900 of 4·2 years, or about 15 per cent. Taking, again, the mean age of those dying above five years of age, the figures are 44·5 for 1883, 47·1 for 1898, and 47·7 for 1900; and for deaths occurring above twenty, the mean ages are 51·4, 51·8, and 52·2 respectively. All along the line, therefore, a progressive increase in longevity is recorded, which must be placed to the credit of sanitary science. The writer from whose analysis the foregoing abstract of figures has been taken pursues his investigation with great minute-

ness of detail with regard to the statistics for each individual town, showing that in point of longevity Perth occupies the place of honour among the eight chief Scotch towns, and Glasgow takes the bottom place in the list. In summarising his results, he remarks that this increase in the duration of human life is attended with some drawbacks; for "an increased proportion of less robust lives are included in those entering upon adult life, while more deaths from more chronic causes play the part formerly taken by the acute and brief diseases of childhood and youth."

The Treatment of Consumption in Edinburgh.

It will be in the recollection of our readers that a very elaborate report on the treatment of consumption was last year submitted to the Town Council of Edinburgh by the Public Health Committee. One of the most important recommendations in the report, following on a suggestion of Sir Henry Littlejohn's, was that provision should be made for the reception of a hundred cases in the last stages of consumption, and the proposal was made that for this purpose a hundred beds might be fitted up in the Infectious Diseases Hospital, the buildings of which would be rendered available by the removal of the establishment to the new Fever Hospital at Colinton. The proposal was not acted on at the time, and the Public Health Committee are now again moving in the matter, and urging on the Town Council the desirableness of taking action at an early date. The portion of the report which explains the proposal, its feasibility and cost, and the estimated benefit to the city, is of great public interest. The cost, it is stated, "would not exceed £50 per bed, or an annual expenditure of £5000. The result would be the immediate abstraction of a hundred sources of dangerous infection. Unhappily, patients who have come to that stage have only a short expectation of life. In a similar institution under the municipality of Paris the experience is that the average life of such patients received into hospital is only three months. That would mean an admission of 400 patients in the course of a year. But even if only 200 patients were received in a year, this would imply a very large reduction of dangerous risk to the lieges." Turning to the financial aspect of the case, the Report proceeds to ask the question, "May the city look for an adequate return for such an addition to its annual burdens?" It may be respectfully answered that, upon the evidence of figures set forth in this Report, there is no expenditure of public money more likely to yield an ample and immediate return. It is not unreasonable to expect that in the way suggested within ten years the mortality from consumption in Edinburgh will be reduced by 200 per annum. But if only 100 lives were saved to the community, it may be claimed that the expenditure would be justified. Upon the experience of last year, the average age at which we lose our people through consumption being about thirty-three, it may be reckoned that each saved life may be taken as good for ten years of labour. There is good authority for taking the annual wage-earning power of each citizen at £35, and £35 capitalised at ten years' purchase would give £350 for each saved life. If the mortality were reduced by only 100 lives, the saving per annum would then be £35,000, which must be admitted to be ample return upon an annual expenditure of £5000. To this saving there should be added the further saving of sick bed expenses, and loss of wages of the victim. It is intended to bring the matter before the next meeting of the Town Council, as the subject is considered one of great importance, if not of urgency.

Burial Amenities in the Hebrides.

The innate conservatism in some matters of the people in the outlying portions of the Highlands makes it difficult to instil into their minds certain elementary ideas of sanitation. An instance of this has occurred in connection with a graveyard scandal in the island of Harris, which is receiving the attention of the Local Authorities. According to the report which has reached us, "the cemetery at Maraig has been allowed to get into a disgraceful state of overcrowding, its general condition being described as a mound of human remains. Of late years, coffin has been placed upon coffin until it was only possible to scrape together from 7in. to 15in. of earth for a covering, the average depth being 9in., while in one spot the coffins are laid side by side, and have only a slight covering of turf over them. The ground has been closed by Privy Council Order; but so tenaciously do the people cling to the old place, despite these disgusting conditions, that no fewer than four interments have been made in defiance of the Authorities." Such a state of things should be deemed disgraceful to any community, but the people of the Western Hebrides seem to be deficient in sensibility in such matters. They cling to the ways and customs of their forefathers, and are slow to appreciate or welcome the march of sanitary ideas. Is it any wonder in such circumstances that fever is ever rife in their midst?

A Place where Pigs are Raised.

In his report on the sanitary condition of the rural district comprised in the Spalding union, Dr. Fletcher gives the description of a farmyard he came across in the course of his inquiry. It was in combination with a slaughterhouse, which opened into a barn, and this in turn opened on to a large manure heap. "On one side of this," says Dr. Fletcher, "was a roughly-constructed pig-stye in a filthy state, and on the other side a swamp of blood-stained washings from the slaughterhouse, which is unprovided with proper drainage. Throughout the district pigs are looked upon as manufacturers of manure. Straw is placed in the run adjoining the stye, and, not only is this left to be trodden down by the pigs with their own urine and excrement, but soiled straw and manure is removed from stables and cowsheds, and is also thrown in. This

process is repeated time after time, and the level of the material rises in the run until it may become three or more feet higher than the ground level, and in wet weather the whole becomes trodden and churned into a decomposing mass of filth, in which the unfortunate pigs wade about, carrying the filth into their styes, and fouling them to such an extent that they have not a clean or dry place to lie on excepting when the interior is provided with fresh straw. Observing one run in front of a stye at Moulton in a very filthy state, I spoke to the owner, a farmer, about it. He seemed surprised, and said that he had cleaned it out only the week before, removing *three loads!* While on the premises some straw and cow-droppings from the adjoining cowsheds were thrown into the run, and some young pigs at once commenced routing amongst it and devouring the manure. The man expressed the view that the pigs got from it any nutriment left by the cow. This may be true, but the practice is disgusting at any time, and especially so when it is considered that the pigs are intended for human food. In this district the pigs practically spend their lives on manure heaps, and devour any filth thrown to them." This utter disregard of all ideas of decency and cleanliness is not confined to the piggeries. In some places, owing to want of cleanliness, want of drainage and insufficient room for the animals, they are in some cases unable to lie down without actually resting upon their own excretions, hence they become in a filthy condition, and their hind quarters, and in some instances even the udders, become fouled with filth. Dr. Fletcher does not hesitate to say that the chief reason for this neglect of sanitary law is largely due to the inadequate administrative staff of the union, and urges as the first step in the path of reform the appointment of a full-time Medical Officer of Health. Spalding has often been urged to do this, and thus bring itself into line with all the other unions of Lincolnshire. It has hitherto neglected to do so, but the Local Government Board has given it to the 24th of June to amend its ways. If it is not done by that date the Board will have something else to say upon the subject.

Local Government in Ireland.

The twenty-eighth annual report of the Local Government Board of Ireland has recently been issued. In many points it possesses exceptional interest, as it deals with the period of transition from the old method of local administration in Ireland, to the new one inaugurated by the Act which established County and District Councils almost similar to those existing in England. Notice is taken of the fact that more than 4000 elections took place upon the same day without a hitch, a point which should not be overlooked by those who advocate that parliamentary elections should all be held on one day. At the outset of their existence the Councils met with many difficulties, notably the refusal of the banks to give financial aid except under guarantees from the Central Board. In the end it is thought this action may really be beneficial, as already the County Councils have had the wisdom to secure good credit balances. Much time has been spent in adjusting the relationships between officers and Councils, and, although one or two special cases have arisen, on the whole matters have now been adjusted, and it would appear that the administrative machinery is in fair working order. The predictions of those who said that the Irish would prove themselves incapable of carrying out the new system are being belied, for the County and District Councils have, with few exceptions, properly discharged the statutory duties devolving upon them, and the Board is confident that ere the first Councils have run their course, everything will be quite in order. In dealing with the public health statistics the Board reports a decrease of 2039 reported cases of fever, and that only 19 cases of small-pox were treated by dispensary Medical Officers during the year. Reference is also made to sewerage works and water supply in rural districts, closing of burial grounds, the enforcement of the Food and Drugs Act, and loans under the Public Health Act (amounting to £4,476,712). Under the Housing of the Working Classes Acts loans have been sanctioned to the amount of £375,164, while for providing labourers' dwellings loans were sanctioned to the amount of £29,816, and grants of £3005 made to boroughs and £36,994 to counties. Out of 16,303 houses authorised, 14,385 have been provided, of which 14,281 are actually let, and 303 others are at present in progress or contracted for. Further improvement schemes have been or are about to be submitted, proposing to provide 8177 new cottages, 2725 additional half-acre allotments to cottages already sanctioned, 277 allotments to existing houses, and 80 acres of land to be parcelled out in allotments to be let to labourers living in villages or towns. The estimated cost of these schemes is about £1,358,135.

Sources of Enteric Fever.

The reference in Sir Henry Colville's book to the causes of enteric fever in South Africa, has given rise to considerable comment in the daily Press, and has called forth one or two interesting letters from private individuals. One of these, giving the personal experience of the writer on the Australian goldfields, is worthy of note, not perhaps for any striking originality, but because of the experience it records. Writing to the *Morning Post*, "Prospector" says: "I would point out that the experience of medical men on the West Australian goldfields, where typhoid and enteric were in the earlier days terribly common, points to bad water as the chief source of infection. Fevers have practically disappeared from Kalgoorlie and Coolgardie now that pure condensed water is obtainable, and Cue is quite a healthy town, though six years ago the normal death-rate was 1 per cent. per diem among the pioneers—to all intents and purposes picked men physically, in the prime of life. In those days drinking water came from surface

pools, and was very dangerous stuff to tackle, but subsequently numerous wells were sunk and good water is abundant. The water of Mount Magnet, sixty miles from Cue, is excellent, and cases of typhoid are not more frequent than in the coastal towns. I have heard the 'dust theory' advanced, but do not think there is much in it. Disturbing the vegetable deposits is productive of a mild kind of low fever, accompanied by headache, but the effect is, generally speaking, only temporary, and must not be confounded with true typhoid." This fully confirms the views stated to us a short time ago by one who had done every colony now gathered into the great Australian Commonwealth, and, really, if we only trace back the history of typhoid epidemics at home, a like result is obtained.

The Changes of a Year.

In his annual report to the Surrey County Council, Dr. Seaton draws attention to the remarkable number of changes which took place in 1900 in the Medical Officers of urban and rural districts of Surrey. Of the thirty-four Medical Officers in the county, sixteen had been changed in the period under review. Dr. Jacob, who has served his Authorities in a manner that has won the admiration of the Local Government Board, decided to relinquish eleven out of the thirteen districts for which he was responsible. His retirement was the subject of universal regret to his colleagues. Reference is also made to the changes in the Guildford rural and Woking districts by the death of Dr. Wellington Lake; at Camberley by the resignation of Dr. Walcot; at Richmond by the death of Dr. Rowland, and at Barnes by the resignation of Dr. Adams. Taking into consideration the two joint Hospital Boards of Mogden (Richmond and Isleworth) and Stoke (Guildford, Godalming, and Woking) there were in all eighteen appointments to be thought of and dealt with, either separately or in combination. In regard to the new appointments, Dr. Seaton expressed the opinion that there were good prospects of having a staff efficient from the standpoint of modern requirements. He anticipated that one important outcome of the changes would be more official attention, in which he expected in due course to share, to the housing question. The sources of milk supply might also well be more under supervision, and in some instances the work of the district Inspector would, no doubt, be closely followed up.

Nice as a Health Resort.

It is a moot point with many people as to whether some of the so-called "health resorts" on the Continent are really what they are represented to be. Take, for instance, the case of Nice, from which place Consul-General Sir J. Harris has recently reported on the trade and commerce for 1900. This, he points out, depends largely upon what "the season" is. But from what he says we do not see that there are any special reasons why people should flock to the town. It is said that during 1900 the public health was "fairly good," because only 36 cases of typhoid were registered by the Bureau d'Hygiène for the whole year. The deaths registered numbered 2311, or about 21 per 1000. This may be a satisfactory rate for France, but we do not deem it so in this country. There are manufacturing towns that can show a better return than this, and there is not a suburb round the metropolis but what would be greatly concerned if its death-rate approached within half a dozen points of such a figure, whilst the average for such a county as Surrey is only 13·7, with about a dozen urban districts where the figures are less than than 10 per 1000. In another part of his report Sir J. Harris states that "the tables and statistics of mortality published each month by the Bureau d'Hygiène appear to me to leave much information out of account which would be of interest. Thus, broncho-pneumonia seems accountable for 210 deaths during the year, and it would be desirable to know how many of these grafted themselves on a previous attack of influenza. There are, moreover, no less than 637 deaths to which no cause whatever is assigned." Of course this may have been put in to let the town down as lightly as possible. But it is quite clear that there is nothing in the vital statistics of Nice, and in fact of many other places in the Riviera to warrant their choice as health resorts in preference to many in our own country. Indeed, perhaps it would be more correct to say that the unhealthy pastimes—for both mind and body—of these places are the greatest attraction to a certain class of individuals.

THE EXTENSION OF CALCUTTA.

The extension of Calcutta southward, the removal of the insanitary bustis that once disfigured the finest residential portion of the town, and the erection of new and magnificent buildings have recently been proceeding with such extraordinary rapidity that we shall shortly be able to speak not only of Greater Calcutta but of New Calcutta. It is especially a matter of congratulation that the bustis, which clung, fungus-like, to the main streets, and gave Calcutta so bad a name among visitors and tourists, are coming down. At one time there was scarcely a street in the block between Park-street and Lower Circular-road which did not contain collections of these unsavoury huts. At the present moment nearly all these streets are clear. A large portion of the worst bustis, that which fronted on Theatre-road and Camac-street, is now being pulled down, and doubtless the whole of it will go as soon as the lease of the present tenant expires. Again, Bamun Busti, which gives its name to one of the most aristocratic wards in Calcutta, is on its last legs. The huts lying between Ballyganj, Circular-road, and Lansdowne-road, were pulled down recently, and the process of demolition is extending westward. These improvements are, however, not due to the municipality but to private enterprise. The very insanitary busti near the north entrance to the docks has been partly cleared away, we understand, by the Port Commissioners, and further south the Bengal-Nagpur Railway has taken up and cleared an enormous area, which was formerly packed with huts of the most primitive description, with no system of ventilation or drainage. The inhabitants of the reclaimed areas have gone down still further south where, though they are further from their work, hut rent is cheaper, and there is more room in which to live and breathe.—*Englishman.*

CORRESPONDENCE.

(*To the Editor of* The Sanitary Record.)

(*We do not in any way hold ourselves responsible for opinions expressed by our correspondents.*)

AUTOMATIC REGULATION OF BACTERIA BEDS.

Sir,—In the "Cross-Table Chat" in your issue of the 16th inst. there is a paragraph mentioning the various apparatus which has been got out for the automatic charging and discharging of bacterial beds. The writer is good enough to recognise our position as the first to bring out apparatus for the purpose; but later on in the paragraph he makes a remark which is calculated to do injustice (no doubt unintentional) to our own and possibly to some other systems. Speaking of an apparatus which has been recently introduced, he mentions that the inventor claims "that by its use there is no loss of head," the suggestion being that head is lost with the other types of apparatus mentioned. As those of your readers who have visited any of our town installations will be aware, our alternating gear works without loss of head, so that its employment does not increase even by an inch the fall which the filters would require if used without gear. This holds good with the shallowest filters in use.

We might add that the requirements which an alternating gear is called upon to meet are much more stringent now than they were when the original works at Exeter were laid down. It is generally considered that the beds should be filled quickly and kept full for a fixed period of time, and drained completely after each discharge. It is also held by many that the opening of the discharge valve should be gradual, so as to prevent the initial rush which would otherwise take place. Our gear is accordingly designed to meet these requirements, as well as that of the Local Government Board that the length of the cycle should be maintained at eight hours as a minimum.—Yours faithfully,

Cameron, Commin, and Martin.

7 and 8, Bedford-circus, Exeter,
May 25th, 1901.

CRIME IN LIVERPOOL, VIRTUE IN LONDON.

Sir,—I note that at the Liverpool Police-court a firm of butchers has been fined for selling as New Zealand lamb meat that had come from Australia, while another firm was also fined for selling River Plate mutton as New Zealand lamb. These are doubtless heinous irregularities, but they pale in comparison with those committed in many butchers' shops in London and the suburbs, namely, the offence of selling as English and Scottish meat the aforesaid Australian, New Zealand, and River Plate mutton, all to my taste equally bad. I am quite despairing of ever tasting either real English beef or mutton again.—Yours faithfully,

X. Y. Z.

FACTORY *v.* HOME-MADE CLOTHING.

Sir,—It is by no means an uncommon occurrence for doctors and sanitary officials to find very great difficulty in tracing the source of infection in cases of notifiable diseases. I wonder how often the link could be found in some one's new suit of clothes. I have often thought of the great risks that are run through the introduction of new clothes into the house which have been made by outworkers. A great prejudice exists in the minds of most men and women against factory-made clothes, yet they are undoubtedly made under better hygienic conditions than those purchased at the fashionable tailors'. In the case of the factory there is the great protection of the Factory Acts. In that of the outworker, no protection whatever. I have often noticed the untidy, dirty-looking young women taking the work into first-class tailors' shops, and only this week saw a girl of about seventeen taking clothes into a good-class City tailor, who was so dirty in appearance that it would have been a public benefit if she could have been taken away to a workhouse, and had her clothes burnt, and the order of the bath conferred upon her.

No doubt my experience is that of others, and I should like to see some steps taken to remedy this condition of things.—Yours faithfully,

J. Robinson.

London, S.W., May 28th.

DIRTY PUBLIC VEHICLES.

Sir,—Some time ago you called attention to the dirty condition of many of our public vehicles—especially emphasising the railway carriages on the Southern lines. I was travelling on one of these lines and saw a notice asking passengers not to put their "feet upon the seats"—some one had added "or you will dirty your boots;" and although the addition was humorous, it was absolutely true. Can nothing be done to compel the offenders to clean their carriages? If the dirty vehicles happened to be cattle trucks the companies could and would be fined, but I know of no means of compelling them to keep clean the carriages used by poor suffering humanity. Again I ask, can nothing be done?—Yours faithfully,

F. Johnson.

REVIEW.

The Economical Disposal of Towns' Refuse. By W. Francis Goodrich, A. I. Mech. E., with seventy-five illustrations. P. S. King and Son. Price 10s. 6d. net.

We have already many books on "refuse destructors and the disposal of town refuse," and this adds one more to the number. The author in his preface informs us that "previous works on the subject have been confined to the disposal of refuse in this country, which," he says, "has been a mistake," and he has introduced information as to American practice. Later on he informs us that there is nothing to compare with our modern British practice, so that after all the necessity for another volume is somewhat doubtful. The work follows very much on the lines of Maxwell's "Removal and Disposal of Town Refuse," and excepting the particulars relating to foreign practice there is really little that is new. Mr. Goodrich is an ardent advocate of refuse destructors, and holds that house refuse has a greater calorific value than is generally supposed, and instances the steam power obtained from burning refuse in Oldham, Rochdale, Darwen, and Warrington. Against this, however, must be set the fact, which is not touched on by the author, that these towns are adjacent to coalfields, where coal is cheap and house refuse contains an exceptional amount of cinders which is not found in districts away from coalfields. Nevertheless, destructors are becoming indispensable in nearly all urban districts, owing to the difficulty of other means of disposal of the refuse from such districts, and it is desirable that Local Authorities should have all the information possible before them before deciding upon the class of destructor to adopt, and whether it is profitable to attempt to utilise the power said to be available for purposes such as electric lighting, &c., and thus have what is termed a combined power plant or otherwise. The author has, however, it appears to us, a good practical knowledge of refuse destructors, and his book is deserving of careful perusal.

Public Works.

SEWERAGE.

DALKEITH has obtained a loan of £1200 for drainage work, and £250 for a disinfecting apparatus.

THE Clerk to the Blaby Guardians has been authorised to make application to the Public Works Loan Board for a further loan of £1411 for sewerage works at Kirby Muxloe.

THE Barrow Rural District Council has sealed a mortgage for £5500 for works of sewerage at Birstall, and has also ordered another mortgage to be sealed for £2145 for works of sewerage at Newton Linford.

THE Bristol Sanitary Committee has resolved to recommend the Council to carry out the construction of the Malago sewer, which formed part of the general sewerage scheme of 1900, at an estimated cost of £27,000.

A SPECIAL meeting of the Machynlleth Urban District Council was held last week to consider the sewerage disposal scheme. The further consideration of the matter was adjourned to the ordinary meeting, the clerk in the meantime to negotiate for suitable land for the works.

FOLLOWING upon the visit of a deputation representing the Royal Commission on Sewage Disposal, to the Beaumont Leys Farm, Leicester, the Borough Surveyor (Mr. E. G. Mawbey, C.E.), has just given evidence before the Commission upon the results of recent experiments in the bacteriological treatment of sewage on the Leicester sewage farm.

THE London County Council, has agreed on the recommendation of the Main Drainage Committee to repair the invert and side walls of the Islington branch of the London Bridge sewer for a length of about 3000ft. between Liverpool-road and Canonbury-road. The work is of such a nature as can only be carried out under a schedule of prices, as it is not known until the repairs are in progress how much of the brickwork will have to be replaced. The cost of the work is estimated at £1950. The Council has also decided that extensive repairs be made to the St. John-street sewer, Clerkenwell, for a length of about 1800ft. between Northampton-street and Albemarle-street. The work will be carried out under the jobbing schedule of prices, and the total cost is estimated at £1170.

A SECOND Local Government Board inquiry was held at Hungerford last week into proposed schemes for draining the town of Hungerford. Unfortunately the result will in all probability be the same. The former scheme was rejected by the Local Government Board on account of the unsuitability of the proposed site of the outfall works, and from the remarks of the Inspector it was evident he regarded the proposed site as being similarly at fault. Mr. Cuss, the engineer, received a lengthy cross-examination from Colonel Slack, the plans and figures being exhaustively dealt with. The scheme proposed to collect the sewage by gravitation to a place called Phelps' meadow, and then it was pumped into a septic tank, or rather a receiving tank. It would be pumped and treated by the bacterial system. The Inspector pointed out the Local Government Board did not sanction such treatment. Mr. Cuss said it was successfully at work at Sutton and other places. This site was the only one available to them without applying for compulsory powers to purchase land, but there were other sites which would be better. The population which would be dealt with under the present plans was estimated at 3000, and the dry-weather flow would be about 20 gals. a head. The water supply was from wells, but there was a scheme in hand for the establishment of a waterworks.

AT a recent meeting of the Hunslet Rural District Council a report was read with reference to the Middleton sewage disposal works, and Mr. Shaw was instructed to prepare plans and estimates for two new settling tanks, the work to be pushed forward as quickly as possible.

THE Sewerage Committee of Aberdeen Town Council met last week and proceeded to inspect the progress of the work at the great sewage and electric-cable culvert at Dee Village. By the aid of candle light the committee walked along the inside of the culvert as far as Marywell-street, and had ample opportunity of viewing the work.

LIEUT.-COLONEL SMITH held an inquiry at Eastbourne last week into the application of the Town Council for permission to borrow £2200 for a public library and baths at Seaside, £1200 for storm water drainage, £875 for the improvement of the Old Tollgate Bridge, and £593 for making up the road to the destructor. The proceedings were of a formal character, and no opposition was raised.

AT a meeting of the Birmingham, Tame, and Rea District Drainage Board, held at the Council House last week, on the recommendation of the Finance Committee, it was decided to borrow £82,000 from the United Kingdom and General Provident Institution at 3¾ per cent. interest for twenty years. The Works Committee recommended the tender of Messrs. Thomas Lowe and Sons, at £8375, for the construction of main carriers between Minworth and Curdworth, and that the Board apply to the Local Government Board for sanction to a loan of £8000 for the drainage of old lands and for the construction of covered carriers. All these recommendations were adopted, the covered carriers, it was explained by the chairman, having been designed at the suggestion of the engineer out of consideration for the public feeling of the neighbourhood.

WATER.

MALMESBURY Corporation has decided to purchase the local waterworks at the price of £6540, the price fixed by arbitration.

THE Crowland (Lincolnshire) Rural District Council, in order to improve the water supply of the town, has decided to commence boring for water, and an engineer has been instructed to carry out the necessary work. The Council is raising a loan of £1000 for the purposes of the undertaking.

THE St. David's Water and Gas Company announces an issue of 1507 ordinary shares of £5 each, upon which interest at the rate of no less than 4 per cent. is guaranteed until April, 1903. The city of St. David's has hitherto been both without water and gas, so that it is argued that this company, which has a capital of £16,000, has a good opening before it. The proceeds of the present issue will be devoted to constructing the authorised gasworks, and for laying gas mains in the principal thoroughfares of the town.

THE residents of Crossgates, Manston, and Stanks are supplied with Leeds water through Hunslet District Council; but, owing to the rapid development of the district, the supply is altogether inadequate now, the people at New Manston and Stanks having experienced a water famine of late. Some time ago the Water Committee of the Tadcaster District Council made arrangements with the Wetherby Water Company for a further supply at 9d. per 1000 gallons, but as the mains will not be constructed before the end of the year, it is stated the Water Committee has decided to erect a reservoir for storage purposes on Whitkirk Hill, by which route the Leeds water is taken. By this means it is hoped to temporarily relieve the necessities of the district.

THE Devizes Corporation has engaged a geologist to advise it as to a new water supply.

AT the last monthly meeting of the Greenock Town Council the Chairman said that in spite of the absence of rain during the past two or three months there was water in store sufficient to last until October.

CONSIDERABLE satisfaction has been expressed at Buxton that the water question has at length been amicably settled. Last week the Duke of Devonshire, K.G., received a deputation, headed by Mr. A. Brown (Chairman of the Council), Mr. C. F. Wardley, Mr. R. Hulme, J.P., the Clerk (Mr. Taylor), and Surveyor (Mr. Grieves), and the whole question was discussed. The details of settlement have not been made public, but the result of the interview with his grace has resulted in what may be termed a close to the dispute which has existed for so many months, and entailed considerable expense.

THE new waterworks constructed at Ruskington, near Sleaford, are now in working order, and at the meeting of the Urban Council last week, the Waterworks Committee reported that, although several houses in the town were without any water supply, the owners refused to bear the cost of laying the water on. It was resolved to levy a rate of 6d. in the pound to cover the initial outlay, and to take steps to compel all owners to provide their tenants with the new supply, unless they could prove to the satisfaction of the Local Government Board that they already possessed a satisfactory supply. The Council also resolved to prevent the retailing of the water to neighbours by those who had made the necessary connection with the main.

THE Select Committee of the House of Lords, presided over by Lord Hawkesbury, sat again last week to consider the proposed protective clauses, the preamble of the Leeds and Harrogate Water Bills having been passed by the Committee. The chief provisions of the agreement are that the Corporation shall not take the lands of Lord Masham, except such lands as are required for the construction of the works and reservoirs. If the Corporation wish the works protected from drainage, they can carry out the same themselves. The reservoirs shall be fenced round, and no barbed wire be allowed. A free supply of water shall be given to Lord Masham and his tenants. The Corporation shall replace the turf where it had been disturbed, and shall compensate the owners for any damage in the case of the bursting of the reservoirs. The Corporation abandon Healey Reservoir.

A LOCAL Government Board inquiry has been held at East Donyland recently into the Lexden and Winstree Rural District Council's proposal to borrow £3100 for purposes of water supply for the parish of East Donyland. The Council's scheme involves the purchase of the brewery lately in the occupation of Messrs. Daniell and Co., and it is claimed for that scheme that the supply of water there is pure and would meet the requirements of the place. The parishioners, however, do not look with favour upon the idea, and have armed themselves with an alternative scheme which they contend will be much more in the interest of the parish if adopted. They sent this to the District Council in the hope that it might be forwarded to the Local Government Board, but the District Council, having already submitted the brewery scheme, and having entered into a provisional contract for the purchase of the brewery—subject to the Local Government Board's decision on the matter—felt that they were unable to entertain the second scheme—whereat the parishioners of East Donyland have waxed exceeding wrath. Mr. Joseph Proctor, a member of the District Council's Committee appointed to consider the question of the Donyland water supply, said over the river at Wyvenhoe something like £1000 had been spent in borings, but here they had a fine supply of water without any risk.

THE Lambton Collieries Company are busy constructing two large reservoirs on the summit of West Herrington Hill, into which water will be pumped from the adjoining East Herrington Waterworks; and, when completed, it is anticipated that there will be a sufficient supply to provide for the whole of the inhabitants of the Herrington, Philadelphia, Shurney-row, and Fence Houses districts.

A BILL to confirm certain Provisional Orders of the Local Government Board came last week before the Examiners of the House of Commons for proof of compliance with the Standing Orders. There was no opposition at this stage, and the necessary formal proofs having been given, the Bill was ordered to be reported for second reading. Among other Orders was one authorising the Corporation of Newark to borrow an additional sum, not exceeding £20,000, for the purposes of its water undertaking.

EXCELLENT progress is reported with the new reservoir which Mr. L. P. Nott is building for the Llanelly Borough Council at Upper Llidi. The reservoir will have a capacity of 200 million gallons. The sum of £70,000 has been borrowed for carrying out the new works, and it is already quite clear that this will more than suffice for meeting the whole cost. Several economies in various directions have been suggested by the contractor and engineers, and Mr. Nott has also offered to complete the contract by March next for an additional £1000. By the terms of the contract the work is to be completed by July of 1902.

IT is worthy of note, says the *Bucks Herald*, that when the Rickmansworth and Uxbridge Water Bill came on for second reading in the House of Commons all the Bucks members spoke against it, and the fallacies of the measure were so clearly shown up in their speeches that it was thrown out by the House without the promoters even striving to take a division upon it. All the speeches were straight to the point. Mr. Grenfell, M.P. for South Bucks, showed the connection between the promoters of the Rickmansworth Water Bill and a leading London Water Company, and the disastrous effects that would follow the passing of the Bill to the localities affected. Mr. Carlile, in a clear and forcible speech, argued on behalf of the Bucks County Council, and demonstrated their reasons for opposing the measure. The member for North Bucks drove his points home in the lucid manner which his constituents appreciate, and clearly showed how the County Council, by opposing the Bill, were acting in the interests of the county. Mr. Rothschild urged geological reasons for opposing the measure, arguing that if it were passed the London Water Company would ultimately appropriate the water that belonged to Buckinghamshire. The result was eminently satisfactory, and the county may congratulate itself upon having three members who can fight its battles so successfully in the Legislative Chamber.

LIGHTING.

THE Stranraer Gas Company have decided to reduce the price of gas from 5s. to 4s. 7d. per 1000 cubic feet.

IT has been decided that a scheme should be prepared for the erection of a refuse destructor in conjunction with the intended electric station at Stoke-on-Trent.

BILLS to confirm certain provisional orders made by the Board of Trade under the Electric Lighting Acts, 1882 and 1888, relating to New Hunstanton and Wisbech, came last week before Mr. Lowther (Chairman of committees of the House of Commons). Formal evidence having been given, the Bill passed the committee stage, and in due course will be reported for third reading.

The Dorking Gas Bill has been read a third time in the House of Commons.

The Bill of the Bath Gas Light and Coke Company, which has been passed by the House of Lords, passed last week through its Committee stage without opposition, before Mr. W. J. Lowther, sitting as Chairman of the Committee of Ways and Means.

At a recent meeting of the Sub-Committee of the Electric Lighting Committee of the Edinburgh Town Council, it was reported that during the year just closed there had been applications for the electric light equal to 194,000 8 candle-power lamps. This, it was stated, far exceeded anything in the experience of the Committee.

The Bill confirming an order granted provisionally by the Board of Trade to enable the Urban District Council of Burgess Hill to lay distributing mains in Church-road, from the railway station to St. John's-road, Keymer-road, from the railway station to Ferndale-road and in Junction-road, from Keymer-road to Oakwood-road, and to break up certain other streets in the district not repairable by the Local Authority in the carrying out of the undertaking, passed through its Committee stage in the House of Commons, last week, without opposition.

Last week a special meeting of the Darlington Town Council was held to consider the question of continuing opposition to the Cleveland and Durham Electric Power Bill in Parliament. A resolution was adopted, on the proposition of the Mayor, seconded by Alderman Barron, that the Bill as amended in the House of Commons was considered unsatisfactory in the interest of the Corporation of Darlington, and that the sub-committee be consequently authorised to take measures to oppose the Bill in the House of Lords. There was no discussion in the open Council.

The growth of Ilford in Essex has been phenomenal. But a few years since it was a country village, now it is going ahead rapidly in those things that make a healthful and prosperous suburb. In addition to having acquired several public parks, it has gone in for an electrical undertaking costing about £70,000, and the light was on Saturday evening formally switched on by the wife of an ex-chairman of the Council, Mrs. Weeden, who was presented with a beautiful silver three-light table lamp. There are thirty-seven arc lamps of 1500 candle-power each, but residential streets are lighted with incandescent electric lamps. Within eighteen months it is expected that an electric tram service will be established.

A Local Government Board inquiry was held at Colchester last week with reference to the application of the Council for sanction to borrow £15,900 for electric lighting. Mr. A. R. Sillar, the Electrical Engineer, said they had overspent the last loan of £6500 to the extent of £664, owing chiefly to the fact that more meters were required and to the rise in the price of copper and cost of service mains. £6500 had been spent to meet the requirements of the consumers in service mains and professional fees. It was explained that £1970 5s. would be required for alterations to machinery necessary upon the proposed doubling of the voltage. The extension was necessary, because they had a great many more consumers than was anticipated; the change of voltage was necessary, because last winter during a heavy "load" the loss was found to be 7½ per cent. They were also to have electric tramways, and for these they would require an increase of power. It was intended to increase the number of accumulators, to re-wind two motors, and make alterations necessary for the higher voltage, &c. The rest would be for generating station extensions, building an underground water-feeder, purchasing new engine, feeder for the new barracks (£1260), &c. The sum of £3900 was for the purchase of the Osborne-street property adjacent to the electric light station.

The Watford District Council has decided to apply to the Local Government Board for sanction to a loan of £31,000 for the purpose of electric light works.

We understand that the Newcastle and Gateshead Gas Company has just contracted for its annual supplies of gas coal. The quantity required is between 130,000 and 140,000 tons, which has been distributed over several North Durham collieries at prices averaging about 9s. a ton delivered at the company's works, Redheugh. Last year the company had to pay as much as 16s. for its supplies.

Bills to confirm certain Provisional Orders made by the Board of Trade under the Electric Lighting Acts 1882 and 1888, relating to the electric lighting of Birstall, Shipton, and Honley, came last week before Mr. Lowther, Chairman of the Committee of the House of Commons. Formal evidence having been given, the Bills passed Committee, and in due course will be reported for third reading.

The Kensington Borough Council has contracted with the Kitson Lighting and Heating Syndicate for forty arc lamps, to be placed on one street, at a cost of £1581 for the posts and lamps, and £25 per lamp per annum for the current, which will make a total cost for the first year for the forty lamps of £2581. Similar terms have been made for two or three other streets in the same district.

For three years in succession, writes a correspondent, the Gas Light and Coke Company have applied to Parliament for powers to raise additional capital, and three times has Parliament refused to grant the request. In 1899 a Select Committee of the House of Commons recommended that the company should adopt a certain course which was calculated to benefit their gas consumers, but up till now the company have shown no willingness to adopt the recommendations; and in consequence of this Parliament has steadily refused to give further capital powers. The company's capital is now practically expended, and, apparently with the object of economising what little they have left as much as possible, they have intimated that they cannot any longer supply penny-in-the-slot meters. At present they have about 125,000 of these meters in use, but no more will be issued till the company have made their peace with Parliament at any rate. One consequence of this decision will be that thousands of the poorer classes in the company's area of supply will be denied the use of gas.

GENERAL.

At the last meeting of the Finsbury Borough Council a resolution was passed disapproving of the Shops Bill and the Shops (Early Closing) Bill, and the Town Clerk, Mr. G. W. Preston, has informed the Home Secretary, the London members of Parliament, and the other metropolitan Borough Councils of the decision.

The report of Mr. Clayton, the officer deputed by the Governor of the Straits Settlements to visit Christmas Island last year, deals mainly with the phosphate deposits, their working, and the condition of the labourers employed on them. At present only a very small space is being worked, but here the phosphate lies in blocks and is conveyed to the shore by trucks running on an inclined plane at the rate of 330 tons per day. Mr. Clayton enters in detail into the treatment of the labourers and others, of whom there are over 550. He describes their residences, food, wages, &c., and thinks the Phosphate Company deals very fairly with them; but he advises the employment of a resident magistrate and a fully-qualified medical man, and also an increase in the hospital accommodation. A Medical Officer has already arrived from England, and arrangements are being made for the permanent residence of a Government officer.

It is reported that a Bill is shortly to be introduced into Parliament which has the object of enabling Urban District Councils to advertise their districts as health resorts, and charge for that purpose against the general district rate a sum not exceeding the amount of a rate of a penny in the pound. The Bill applies only to England.

The popular West Somersetshire watering-place of Minehead wore a gay appearance on Saturday last, on the occasion of the opening of a new pier, which has been erected at a cost of £12,000. The opening ceremony was performed by Mr. George Fonnes Luttrell, of Dunster Castle. The new pier will enable passengers to land at nearly all tides.

The Streets Committee, at the last meeting of the Common Council (London), reported as to subsidences which had taken place in the carriageway of King William-street, Great Tower-street, and Eastcheap, and that these disturbances had been made good at a cost of £300. In answer to a question, the City Engineer said it was difficult to assign any exact reason for these subsidences, but they had probably arisen in consequence of the recent construction of tubular and other railways.

At a meeting of the Henstead Rural District Council held last week, the question of the contemplated extension of the sewage farm at Kirby Bedon by the Norwich Corporation was discussed at considerable length, and it was unanimously resolved that the Corporation Authorities at Norwich be informed that as the proposed extension would create a nuisance and be prejudicial to the health of the surrounding inhabitants, it would be their duty on its completion to take the necessary steps to have the same abated. In this the Council is desirous of preventing trouble and expense in the future both to themselves and to the Norwich Corporation.

The New Joint Fever Hospital for Dumbarton, erected on a site at Havock, by the Western District Committee of the County Council of Dumbarton and Dumbarton Town Council, was opened recently. The site on which the hospital stands is in a commanding position overlooking the Clyde, and extends to nearly five acres. The buildings consist of administrative block, two pavilions (each of two wards), caretaker's house, &c. The original cost was estimated at £14,000, but this had been exceeded. The plans were prepared by Mr. John M. Crawford, architect, Dumbarton, and the work was carried out under the care of Mr. G. Roxburgh, Inspector of Works. The wards are capable of holding forty-four beds. The sewage is to be treated by means of the septic tank principle.

The attention of the Halifax Special Sewerage Committee having been directed by the Local Government Board to the sanitary condition of the town, it made an inspection recently. At the end of Hollings-lane, at Old Causeway, and in Water-street, the sewage pipes were found well-nigh blocked with refuse, emitting most objectionable smells. The Committee then held its usual meeting. The Local Government Board had asked that the dry-weather flow in the sewage pipes should be verified, and that the Council should state what it intended doing with Sowerby. According to the latest letter, Sowerby, with a population of 3000, sends 70,000 gallons per day, while the estimate of the Sowerby Bridge flow is 130,000 gallons, and it has four times the population of Sowerby. Either Sowerby or Sowerby Bridge had made a mistake, and the question arises, "Does Sowerby really pay on the capital expenditure the Sowerby Bridge Council has provided for 70,000 gallons?" Sowerby has been asked to verify its figures. The suggestions in the letter of the Local Government Board will, we understand, mean an additional expenditure of some £10,000 to £12,000 more acreage being required at the sewage works at Milner Royd.

It is gratifying to announce that small-pox is abating in Dundee. There were fourteen cases in hospital last week, none of a virulent type, and it is expected most of the patients will be discharged shortly. There are no inmates in the temporary reception house. The precautionary measures which have been adopted by the Medical Officer and the sanitary department have not been relaxed in any way, and unless another outbreak occurs the city will be clear of the malady very shortly.

The insanitary condition of Broadstone, a question that was ventilated at the last meeting of the Poole Rural District Council, is giving rise to considerable anxiety on the part of the inhabitants and those who are interested in the health of the district. If there are bye-laws dealing with cesspools, then it should not be necessary for moral compulsion or pressure to be exercised in order to make the Council take steps to carry them into effect. Familiarity with unpleasant facts sometimes tends to blunt the powers of perception, but the condition of affairs at Broadstone is by no means either to be desired or commended.

After many months of hard work by the Local Committee, we are glad to know that South Londoners are now assurred of the additional 43 acres being added to Brockwell Park. The whole of the sum required, £66,800 odd, has been promised, the London Parochial Charities having offered a further generous contribution. For rescuing this beautifully wooded land from the hands of the enterprising jerry builders, London is indebted to the London County Council, the Municipal Bodies of Lambeth, Camberwell, Newington, St. George-the-Martyr, and Southwark, the Ecclesiastical Commissioners, the London Parochial Charities, the Peabody Donation Fund, the Commons and Footpaths Preservation Society, Mr. H. C. Gooch, and the Skinners', Goldsmiths', Merchant Taylors', Drapers', and Armourers' Companies; also to many generous donors towards the necessary working expenses.

At a recent meeting of Bo'ness Town Council, the Special Committee appointed to negotiate with proprietors in the insanitary area in the centre of the town, reported that they had come to terms with certain of the proprietors in the Vennel. Property of the value of some £2000 had been purchased, and improvements at this narrow dangerous part of the street would be gone on with immediately. As the whole of the properties in the scheduled area must be purchased before 13th July, 1902, the Town Council granted authority to the Committee to negotiate for the acquisition of the rest of the properties. It was agreed to borrow on temporary loan, and that a permanent loan be afterwards negotiated, payable in fifty years. It was resolved that the authorised borrowing for the street improvement at North-street be raised from £4500 to £5300, and that this sum, less the £2300 already borrowed, be got on temporary loan.

The question of watering the streets of Newport now that the dust is very much in evidence occupied the attention of the Corporation recently. Mr. J. Liscombe voiced the feelings not only of the tradesmen in the main streets for keeping down the dust which now spoils their stocks, but also the wishes of those in the streets where private residents live. The Chairman of the Sanitary Committee said at present the main streets were watered once a day, and those who used the streets for vehicular traffic had a strong objection to more watering than that. Mr. A. E. Parfitt suggested that the streets be washed early in the morning. It was like a Johannesburg dust storm at times in the main streets, and drapery goods especially were spoiled. Mr. F. Phillips suggested that the streets should be swilled from fire hydrants. Alderman Jones said the matter would be tried as an experiment, but the Sanitary Committee had been informed by the Waterworks Committee that the reservoirs were running down.

The enormous cost of vaccination under the new Act is, we understand, causing some concern among metropolitan poor law unions. In West Ham, for the year 1898 the amounts paid to Medical Officers was only £289 12s. 10d., and to the vaccination officers £311 8s. 3d. Last year, under the new Acts, the amount paid to the public vaccinators was no less than £2242 4s. 6d., while the vaccination officers received fees amounting to £647 4s. 3d., the amount paid to each of the two officers being £31 and £30 respectively.

The Institute of Preventive Medicine is at length installed in its new building near the north-east corner of Battersea Park, but we learn that the "vivisectionists" are not to have the field all to themselves in this neighbourhood. At the opposite corner of the park a large house, locally known as "The Folly," which has many years remained without a tenant, has been acquired by the Anti-Vivisection Society, and is now undergoing extensive alterations with a view to its opening shortly as an "Anti-Vivisection Hospital."

A special meeting of the Sanitary Committee of the Llanelly Urban Council was held last week to draw up replies to give to Local Government Board inquiries in respect of the housing of the working classes in the district. Messrs. T. Hughes and Joseph Williams remarked that there was a distinct want of housing accommodation in the town for labourers receiving from 18s. to 22s. per week. There were plenty of houses at 5s. and 5s. 6d. per week. It was decided to give the answer, and to say that the question of making provision under the Act was under consideration.

At a special meeting of the Bath Surveying Committee, a report was considered from the Scavenging Committee with regard to the alteration of the destructor. Alderman Taylor said it was absolutely necessary that the work should be got on with at once. Mr. Fortune had prepared a report which dealt with the question of introducing forced air draught. The work could be done for £1242, and the Scavenging Committee recommended the acceptance of a tender by Messrs. Goddard, Massey, and Warner. This recommendation was agreed to, and a meeting of the Urban Sanitary Authority will be held shortly to confirm it.

Sir Kenelm Digby, Permanent Under-Secretary at the Home-office, presided at a conference last week to consider representations from persons engaged in the tanning industry and other trades involving the handling of hides as to the Home-office rules for the protection of workmen from infection by anthrax. Mr. W. L. Jackson, M.P., was among the speakers, and it was pointed out that the wearing of gloves was an impediment to work, and that a garment fitting tight at the wrist and at the neck would be sufficient protection. Other matters were referred to, and Sir Kenelm Digby promised that all the suggestions made should be considered before any further rules were made.

National Health Society.

OFFICIAL TRANSACTIONS.

Sanitary Inspectors' Examination.—It is satisfactory to note the success of the Society's students in the recent examination held by the Sanitary Inspectors' Examination Board. As before, the majority of the female candidates were students from the National Health Society, and all these ladies were successful in obtaining the certificate. The names thus added to our list of successful students are as follows:—Miss Adeline E. T. Biggs, Mrs. Theodora Fisher, Miss Madeleine Stampa, Miss Anne Hutchinson, Miss Florence Potter.

PERSONAL.

Mr. A. A. Piccaven has been reappointed Inspector of Nuisances for Long Sutton, at the same salary.

Dr. Boustead has just resigned his position as Medical Officer of Health for Hexham, after eleven years' service.

The salary of Mr. Wm. Gray, as Distribution Engineer to the Birmingham Water Committee, has been increased from £300 to £400 per annum.

Dr. C. Killick Millard, Medical Officer and Public Analyst for Burton-on-Trent, has been appointed Medical Officer of Health, Superintendent of the Isolation Hospital, and Public Analyst for Leicester.

Dr. Richardson has been reappointed Medical Officer of Health for Eppingham for six months.

Mr. T. W. Witts has been reappointed Inspector of Nuisances for East Alton, for one year, at a salary of £60 per annum.

Mr. C. W. Thompson, the present Surveyor for Ripley, has been appointed Inspector of Nuisances at a salary of £60 per annum.

The Local Government Board has approved the appointment of Dr. Scott as Medical Officer of Health for Castle Donington.

Mr. William Tedham, of Tunbridge Wells, has been appointed temporary Sanitary Inspector for Woolwich for six months, at a salary of £120 per annum.

Mr. J. A. Gray, of Cumberland, has been appointed gas manager to the Teignmouth Corporation. There were fifty-five applicants for the post, to which is attached a salary of £150 per annum.

Dr. A. Wellesley Harris, Medical Officer of Health at Southampton, has been unanimously appointed as Medical Officer and Analyst to the Metropolitan Borough of Lewisham, at a salary of £800 per year.

The Chief Inspector of Factories has appointed Dr. A. C. K. Turner to be certifying surgeon under the Factory Acts for the Fairford District of Gloucestershire, and Dr. E. F. Clowes for the Wootton-under-Edge District.

Mr. Thomas W. Dee, son of Mr. T. G. Dee, treasurer of the Sanitary Inspectors' Association, has passed the examination of the Sanitary Inspectors' Examination Board, thus qualifying himself for an appointment as Sanitary Inspector. He has already taken honours in plumbers' work under the City and Guilds of London Institute.

After a brief illness the death has just occurred of Mr. J. M. Brydon, vice-president of the Royal Institute of British Architects. In London he designed many public buildings, and at the time of his death was architect of the new Local Government Board and Education Department building that is being erected in Whitehall at the corner of Parliament-square.

We regret to record the death of Dr. Robert Skimming, which took place after a long illness at his residence, Trevor Lodge, East Molesey, on Thursday week. Dr. Skimming, who was 58 years of age, had been suffering for some years, but the end came somewhat suddenly. He was M.D. Edinburgh, 1864; F.R.C.S. 1873 (L.M. Univ.), and R.C.S. Edinburgh, 1864, and a member of the British Medical Association. He went to East Molesey over thirty years ago, and succeeded the late Dr. Rowlands as Medical Officer of Health under the Local Board. He was also Vaccination Officer and Poor Law Medical Officer for their district, and Medical Officer to Court Good Intent Ancient Order of Foresters for many years. He retired from these public offices in 1892. He was the author of a well-known medical work on epilepsy. He leaves a widow, one son (who is in New York), and three daughters, for whom much sympathy is felt.

CONSTRUCTION OF ROADS AND STREETS IN GIBRALTAR.

We gather from the Annual Report of Dr. H. P. Elkington, Medical Officer of Health, Gibraltar, that the roads and streets of the colony have been constructed of three different materials, viz.:—(1) Limestone macadam, (2) wood, (3) concrete. Macadam roads had been constructed throughout the colony, but for various reasons were replaced by wood and concrete in the principal thoroughfares of the business portion of the city. The macadam roads still existing, such as are vested in the Commissioners, are good, and maintained in satisfactory condition; but on steep gradients they are at times found to be slippery; this is a condition said to be inseparable from the limestone used in their construction when watered by sea water. Nevertheless, from a sanitary point of view, the roads constructed in this manner, when satisfactorily cleansed and maintained, are far superior to other formations of a more expensive character.

The wood pavements have proved to be quite unsuitable in this climate; they absorb the urine, &c., from animals, and in consequence throw off in hot weather a most disagreeable smell, and the dust from them is most injurious. They appear not to be durable, and are said to be twelve times as costly in construction as other forms which are more suitable.

The concrete roads are rough, noisy, and expensive. It would appear that the Commissioners do not contemplate repeating the experiment of covering the surface of their streets with this material.

During the last few months a new form of pavement has been introduced into the colony, known as "Tar Macadam." This is noiseless, impervious, free from dust in summer and mud in winter, is easily cleaned, and forms a really effective sanitary paving. It is understood that the Commissioners are trying it as an experiment in this climate, as it cannot be positively stated what effect the sun may have upon it in the hot months. If it stands the test of the summer satisfactorily, its advantages are so great that it is to be hoped it will be used to replace the insanitary wood pavements with as little delay as financial considerations will permit.

NOTES AND QUERIES.

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2209.—Houses for the Working Classes: Book Containing Plans.—"J. E. H." writes:—"Can you refer me to any publication giving reliable advice as to the building of healthy working-class cottages? Information is required as to general plan, and good but inexpensive sanitary fittings."

Answer.—The best book on the subject is undoubtedly Cranfield and Potter's "Houses for the Working Classes in Urban Districts," comprising thirty typical and improved plans arranged in groups, with elevations for each, and block plans, &c., also introductory and descriptive text, general notes on planning, tables giving sizes of rooms, cubic contents, cost, &c.; price 15s. 9d. post free. For a reliable book on sanitary fittings as asked for, Jensen's "House Drainage and Sanitary Fitments," price 5s. 3d. post free. Either of the books may be obtained from the office of this journal.

2210.—Combined Drainage: Premises Within Same Curtilage.—"Inspector" writes:—"A combined drain receiving the drainage of three cottages, belonging to one owner, as in accompanying sketch, is in a defective condition, and a nuisance is caused on adjacent premises. The owner of the combined drain has been served with a preliminary notice to repair the drain, but disclaims all liability, and refers us to Section 4 of the Public Health Act, 1875. Will you please advise as to who is responsible?"

Answer.—The combined drain receives the drainage of three houses within the same curtilage, and it is a drain repairable by the owner. See Pilbrow *v.* St Leonard's, Shoreditch, 1 Q.B. 33, 59 J.P. 68. The Authority should serve notice upon the owner under Section 41 of the Act of 1875, and on his default execute the work and recover the cost.

2211.—Sale of Food and Drugs Acts: Skimmed Milk, Proceedings.—"J. P. H." writes:—"An Inspector appointed under the Sale of Food and Drugs Acts asked for a pint of milk, and was served. He divided the sample. The analysis certified it was deficient in butter fat to the extent of 12 per cent. A summons was issued under Section 6 of the Sale of Food and Drugs Act. The justices dismissed the summons, contending that to have succeeded the Inspector must ask for new milk, basing their decision on Lane *v.* Collins. Can you inform me if there is not a more recent decision wherein it is held that an Inspector is not obliged to ask for 'new milk' to succeed under Section 6?"

Answer.—In the case of Lane *v.* Collins, 14 Q.B.D. 93, 49 J.P. 89, proceedings were taken under Section 6 for that the respondent who was asked by Lane, appellant, for milk, and was supplied with skim milk, and a metropolitan police magistrate had refused to convict on the ground that Collins had committed no offence within the 6th Section, inasmuch as Lane had asked for milk, and got milk, but milk which had been skimmed; and this decision was upheld on appeal. The proceedings in such cases should, however, be taken under Section 9, which provides that "no person shall, with intent that the same may be sold in its altered state without notice, extract from any article of food any part of it so as to affect injuriously its quality, substance, or nature, and no person shall sell any article so altered without making disclosure of the alteration," and should not be taken under Section 6. The querist does not state whether the vessel containing the skimmed milk was labelled as required by Section 11 of the Sale of Food and Drugs Act, 1899. If this was not the case, proceedings should be taken under both of the sections referred to.

2212.—Combined Drainage, Drain or Sewer, Cesspool and Gully: Meaning of Terms.—"Inspector" writes:—"(1) I enclose sketch showing a block of houses owned by one owner. Your opinion is asked as to whether the main drain is a sewer, and for the cleansing and maintenance of which the Council is responsible. Would the vesting be different if the houses belonged to several owners? (2) Please define the difference between a cesspool and a gully, or what is the meaning of the term cesspool in the scavenging clauses? Should I take it that before the Public Health Act, 1875, was passed that a trapped gully was unknown, and that the gully has replaced the cesspool within the meaning of the Act?"

Answer.—(1) From the sketch submitted it appears that the whole of the houses have one common backyard, in which the main drain and other drains are laid. The houses are within the same curtilage, and the combined drain is consequently a drain and not a sewer. See Pilbrow *v.* St. Leonard's, Shoreditch (1895), 1 Q.B.D., 433, 59, J.P. 68; St. Martin's-in-the-Field *v.* Bird, 1 Q.B.D., 420. The duty to cleanse and repair will be on the owner. (2) A cesspool is a well constructed below ground level to receive the sewage from a house or number of houses. It is not supposed to be provided with an overflow. A gully is a small chamber formed usually in one piece of iron or stoneware for the reception of sink wastes, rain-water, &c., and is connected to a drain, into which the contents are delivered. It should be trapped and provided with a grating over it. Gullies of iron and stoneware are, of course, now used to receive the washings from streets. The querist's surmise that the gully has replaced the cesspool is not correct. Cesspools still exist in most rural districts.

2213. — Smoke Nuisance from Workshop Stove. — "Inspector" writes:—"Will you please advise as to whether a Local Authority are enabled to take proceedings against a cooper for an alleged nuisance caused by smoke emitted from an ordinary stove in his workshop used for warming the room, and in which he frequently burns his waste material? The chimney to this stove is no higher than the bedroom windows of two adjacent houses, and when the wind is in a particular direction the occupiers have had to close their doors and windows on account of the above."

Answer.—The Local Authority may institute proceedings under Secs. 94 to 96 of the Act of 1875, the offence being that defined by Sub-sec. 7 of Sec. 91, of not consuming the smoke arising from the combustible used therein.

2214. — Houses Draining into Cesspool: Easement.—"C. H. C." writes:—"A field and four cottages have been sold to two separate purchasers. A has purchased the field, and B has purchased the cottages adjoining. In the field there is a cesspool (now full), into which the four cottages drain. The Local Authority have served notices, separately, upon A and B to cleanse the cesspool. Please advise (1) who is liable, A or B?

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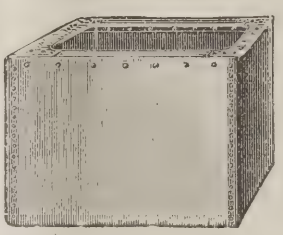

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(2) If B undertakes to cleanse (and he seems inclined to shift it on to A) can A ask for compensation in respect of passing over his land, opening up, &c. (3) May A fill up the cesspool (of course by giving notice), or prevent the drainage from being discharged on to his property?"

Answer.—(1) The owner of the cottages will be liable. (2) Both A and B have purchased the properties, subject, we think it will be found, to the easement of the drain and cesspool on A's land. B should refer to the deeds of his property, which will contain a clause relative to the easement, but apart from this we should say that an easement has been acquired, and B will have a right of passage to the cesspool over A's land for the purpose of emptying it. Compensation will be payable only if damage be created. (3) No.

2215.—Petroleum Acts: Whether Sanitary Inspector can be Required to Carry Out Duties of Inspector Under.—"M. S." writes:—"Can a Rural District Council compel their Inspector of Nuisances, who was originally appointed without such duties, to carry out the duties of Inspector under the Petroleum Acts without additional remuneration?"

Answer.—If the Inspector of Nuisances was appointed subject to the General Order of the Local Government Board of the 23rd March, 1891, and half his salary is repaid by the County Council, the Local Authority are not entitled to require him to carry out the duties of Inspector under the Petroleum Acts without additional remuneration. The officer may himself appeal to the Local Government Board by letter on the subject, and ask for their guidance.

2216.—Insufficient Drainage: Property Changing Hands after Notice.—"J. W." writes:—"Notices were served some time ago by this Urban District Council under Secs. 36 and 41 of the Act of 1875 on the owners of two contiguous houses, the drainage of both houses being conveyed through one house; one of the owners commencing carrying out the work before obtaining the consent of the adjacent owner. The latter has now sold his house to the owner of the one who had carried out the notice. the property being sold with the declaration that a notice had been served by the Sanitary Authority. One person now belongs to the two houses, and he declines to do the work, alleging that that which was formerly a drain is now a sewer. Will you please advise what position my Authorities are in

Answer.—At the time of service of the notice the drain was a private drain, repairable by the owners. The notice, in our opinion, still holds good, and the Local Authority may do the work on the owner's default, and recover the expenses.

2217.—Public Slaughter-houses: Slaughtering in Private Premises.—"E. R." writes:—"In this urban district a public slaughter-house was erected some years ago by the Sanitary Authority. Several of the butchers have now commenced complaining of the buildings and the rules, and have tried to erect private slaughterhouses for themselves within the Borough, but have been refused. Recently one of them has commenced to slaughter on a farm outside the Borough, and he brings the carcase to his shop in town. Your opinion is therefore kindly asked what power, if any, has the Urban Authority in the matter? What powers have the Rural Authority in whose district the farm is situated, to prevent this or any other building from being used as a slaughter-house?"

Answer.—The Urban Authority may prevent the erection or use of any building intended for a slaughter-house, by refusing to grant a licence for the erection or use of any such building. They are unable, however, to prevent the erection and use of slaughter-houses or buildings used as such outside their own district. The Rural Authority, if they do not already possess Model Bye-laws with respect to slaughter-houses, might be asked by the Urban Authority to adopt bye-laws for their district appertaining to slaughter-houses. The Rural District Council may be invested under Sec. 276 of the Act. of 1875 with the powers of an Urban District Council under Sec. 169 of the Act, to make bye-laws and control slaughter-houses within their district.

2218.—Public Highways: Footway Improvement.—"Surveyor" writes:—"In my district, which is an urban one, it is proposed to construct and pave a footway alongside the old highway which passes through the town. This highway is about 25ft. wide, and alongside it, but set back about 7ft., were built—some of them fifty years ago—dwelling-houses. It was evidently intended that a pavement should be made along the front of the houses. This, however, has only been carried out by a few owners. The Council have now adopted the Private Street Works Act, 1892, and I have prepared plans for a 6ft. pavement along the front of these houses. Will you kindly advise who may be required to pay for the paving—the owners of the houses, or should the Council do the work out of the rates?"

Answer.—It would have been helpful to us if we had been furnished with a plan of the proposed work, and also one showing the conditions as now existing. It appears to us, however, that the owners cannot be required to contribute to or bear the cost of the footway paving. From the informatien given it does not appear that the 7ft. strip has been dedicated as a public highway. The Council should do the work and charge the cost to the district fund.

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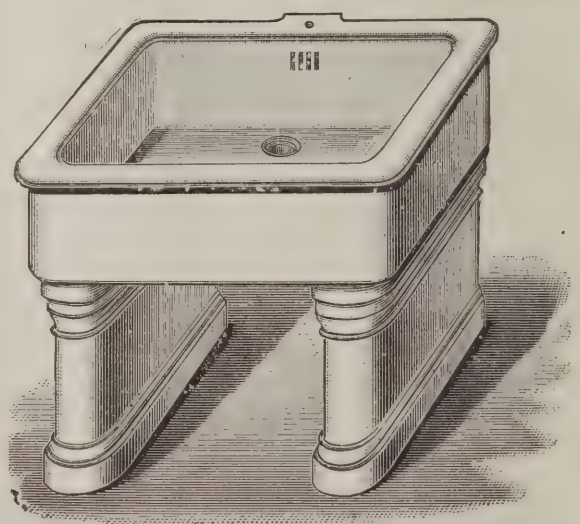

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THE CONSTRUCTION OF ROADS, PATHS, AND SEA DEFENCES.

By Frank Latham, C.E.

(Borough Engineer and Surveyor, Penzance. Author of "The Sanitation of Domestic Buildings," &c.)

CHAPTER I.—INTRODUCTION.

There are few questions which have such a practical bearing on the progress of a nation, the advancement of civilisation, the furtherance of knowledge, and the numerous advantages to be derived from easy intercourse between all parts of a country, as that of the effectual construction and maintenance of roads.

It is a matter of much importance in these days of competitive industry and increasing needs of commerce, bringing in their wake the ever-growing demand for increased facilities of exchange and transport, and the more extensive adoption of modern modes of locomotion, that all roads should be constructed in the most efficient manner, so as to best conform to the requirements of the times; thus their durability of construction and those conditions necessary for safety and ease in travelling should be carefully considered, and the best course adopted, thereby reducing as much as possible the amount of wear and tear to horses and vehicles, and at the same time contributing to the comfort of those whose business causes them to be "on the road."

The economies derived in a system of good roads over even secondary ones must be considerable, but when compared in these days with the bad roads of a century or more ago, the saving to the public must be enormous, besides abolishing an inconvenience which would be absolutely intolerable to the high standard of excellence expected by the public at the present day.

Sir Henry Parnell says:—"The measures necessary to be taken for affording the means of travelling with rapidity and safety, and of transporting goods at low rates of carriage, form an essential part of the domestic economy of every people. The making of roads, in point of fact, is fundamentally essential to bring about the first change that every rude country must undergo in emerging from a condition of poverty and barbarism. It is, therefore, one of the most important duties of every Government to take care that such laws be enacted, and such means provided, as are requisite for the making and maintaining of well-constructed roads into and throughout every portion of the territory under its authority."

In populous districts, large towns, and health resorts, it is of paramount importance, apart from the desirability of good roads for traffic, that all roads and back courts should be maintained in a proper state of repair, from a sanitary point of view. A residential district with bad and neglected roads and courts cannot be regarded as healthy. Cleanly roads in proximity with dwellings play an important part in the sanitary education of the inhabitants, and no dwelling can be regarded as perfectly sanitary, especially in crowded localities, when abutting on neglected and, perhaps, narrow, sunless, and inefficiently-drained roads.

Since the introduction of railways there is practically greater demand for good roads in and about towns than was previously the case, the fact that railways have set in motion the whole of the people and commerce calling for the provision of the best facilities for transportation to and from these main centres and arteries of the country.

It is by means of the railways that so many thousands of persons flock to the seaside towns and other health resorts at various seasons of the year, calling forth in no small degree the construction of beautiful roads, promenades, and drives, sometimes entailing much engineering skill and considerable outlay of money.

The railway has, by its rapid conveyance of commerce and passengers from one locality to another, placed the remotest parts of the country within easy touch with the great centres, and has been the means of opening out many delightful and hitherto unfrequented districts, all in their turn requiring improved means of intercommunication.

As the earlier history of the advancement of road making in England is interesting, it is as well that before entering on to the present methods of construction, that an outline of the past should be briefly sketched.

The Carthaginians have the credit for the invention of paved roads. The Romans, who were in touch with the Carthaginians from about 500 years B.C., became well instructed in the art of road making, and in the year 312 B.C., Appius Claudius partly constructed the most noble of Roman roads, named after him the Via Appia, or Appian Way.

The interest taken in the construction of roads by the Romans was exceedingly great, so much so that under Augustus and Julius Cæsar all the principal cities and towns were made to communicate with Rome by paved roads, which work was followed by numerous similarly constructed roads communicating throughout Europe and continuing through neighbouring continents and islands, the direct lines of the great roads being maintained from shore to shore.

Mr. Tredgold says:—"The Roman roads ran nearly in direct lines; natural obstructions were removed or overcome by the effort of labour or art, whether they consisted of marshes, lakes, rivers, or mountains. In flat districts the middle part of the road was raised into a terrace. In mountainous districts the roads were alternately cut through mountains and raised above the valleys, so as to preserve either a level line or a uniform inclination. They founded the road on piles where the ground was not solid, and raised it by strong walls, or by arches and piers where it was necessary to gain elevation."

Pinkerton's Geography contains the following remarks on the Roman roads of England: — *The Roads of England*, "which may still be traced in various ramifications, present a lasting monument of the justice of their conceptions, the extent of their views, and the utility of their power. A grand trunk, as it may be called, passed from the south to the north, and another to the west, with branches in almost every direction that general convenience and expedition could require. What is called Watling-street led from Richborough in Kent, the ancient Rutupiæ, northeast through London to Chester. The Ermine-street passed from London to Lincoln, thence to Carlisle, and into Scotland. The Foss way is supposed to have led from Bath and the Western regions, northeast, till it joined the Ermine-street. The last celebrated road was Ikeneld, or Ikneld, supposed to have extended from near Norwich, southward, into Dorsetshire."

Upon the Roman power being broken up, their successors allowed the roads to fall into a bad state of repair, in fact cared little or not at all for them, so that in course of time these magnificent roads were practically ruined by absolute neglect and contempt.

It was not until comparatively recent date that successful road-making was practised by modern nations. England and France gave but very little attention to the construction and repair of roads until about the 17th century. Prior to this time the roads of this country were allowed to remain in the most disreputable condition, and in some places almost impassable. As recent as 1770 a publication by Mr. Arthur Young, describing his tour in the North of England, gives some very striking accounts of the state of the roads at that time. In describing some of the turnpike roads, he explains that the road from Wigan was so bad that

he measured ruts in its surface 4ft. in depth, and that the road's surface is mended merely by "tumbling in some loose stones, which serve no other purpose than jolting a carriage in the most intolerable manner." The road to Newcastle appears to have been even worse than the Wigan one. Mr. Young says:—"A more dreadful road cannot be imagined," and that he was obliged to hire two men at one place to support his chaise from overturning. He says:—"Let me persuade all travellers to avoid this terrible country, which must either dislocate their bones with broken pavements, or bury them in muddy sand."

Mr. Thomas Codrington, in his work on "The Maintenance of Macadamised Roads," says:—"On the ordinary highways, improvement was hindered by the system of statute duty, and by parish management under a person chosen yearly to serve the office of surveyor of highways. Everyone who kept a team of horses was liable to be called upon to do six days' team work, and those who did not keep horses paid money instead. The parish surveyor generally had no special knowledge of road repairing, and the team labour and other work were seldom well applied."

Under this system the responsibility of maintaining roads near towns or between towns would come very heavy upon those few persons who were expected to provide the funds for carrying out the necessary repairs.

The first attempt to improve the highways was by the introduction of the turnpike system.

The first turnpike road was established by law in 1653, by means of which a toll was imposed upon all but pedestrians that passed through the gate. This toll was then used for purposes of road-making. It appears, however, that the people were prejudiced against the system of toll gates, and that for many years the turnpikes were few.

At the end of George the Second's reign the system was put into more general operation throughout the country.

It was, therefore, the end of the 18th century before any marked improvement was made in the defective state of the roads.

The following extract from an essay on the "Construction of Roads, dated 1813," by Mr. Edgeworth, will show the defective condition of roads that existed even in the early part of the 19th century. Mr. Edgeworth says:—"In many parts of this country, and especially near London, the roads are in a shameful condition; and the pavement of London is utterly unworthy of a great metropolis."

Early in the 19th century rapid changes began to take place in road making, largely due to the labours of Metcalf, Telford, McAdam, and others.

Mr. McAdam, in his "Remarks on the Present System of Road-making," says the then existing practice of making a road in England and Scotland was "to dig a trench below the surface of the ground adjoining, and in this trench to deposit a quantity of large stones, after this a second quantity of stones, broken smaller, generally to about 7 lb. or 8 lb. weight; these previous beds of stone are called the bottoming of the road, and are of various thicknesses according to the caprice of the maker, and generally in proportion to the sum of money placed at his disposal. On some new roads made in Scotland in the summer of 1819 the thickness exceeded 3ft. That which is properly called the road is then placed on the bottoming by putting large quantities of broken stone or gravel, generally 1ft. or 1ft. 6in. thick at once upon it, and from the careless way in which it is done the road is as open as a sieve to receive the water which is retained in the trench, whence the road is liable to give way in all changes of the weather."

(*To be continued.*)

INFECTIOUS DISEASES, DISINFECTION, VENTILATION.

By W. Arnold Evans, M.D., Medical Officer of Health, Bradford.

(*Concluded from page* 465.)

Although it is the safest plan to consider that anyone suffering from a fever is equally infectious during every period of its course, yet there are stages in the course of some affections in which the poison seems to be more powerful than at others; in measles and whooping-cough the infection is very powerful at the onset of the disease, which fact is one reason why these infantile affections are so difficult to control, one child becomes infected almost as soon as, or before, the affection in another child has been recognised.

In diphtheria one must regard the patient as infectious for as long as any of the characteristic bacilli can be cultivated from the mucous membrane in the throat. In scarlet fever the infection may remain for a long time—indeed, it is difficult to say when people who have suffered from scarlet fever may with safety mix with their fellows; at any rate, they remain infectious for as long as the skin peels or there is any discharge from the ears or nose.

Now the behaviour of disease-producing organisms in bringing about the conditions peculiar to any disease is not always the same. The microbe may enter the body through some delicate membrane, gain access to the blood stream and multiply rapidly, and so cause the symptoms characteristic of its presence. As an example of this method of infection I may mention those diseases which generally are known as "blood poisoning" and relapsing fever, or, the bacillus may enter an organ of the body, may remain there and set up an inflammatory action, resulting in a perversion of tissue growth with consequent tissue death and the formation of abscesses and cavities, *e.g.*, phthisis. Or, again, it may become attached to the surface of a mucous membrane, multiply, and produce a poison which is absorbed as in diphtheria.

Now the germ theory of disease is closely allied to the question of immunity, and immunity may be either natural or acquired. By *natural* immunity I mean that some animals are not liable to be infected by a bacteria that would produce a disease in others. This immunity depends upon several conditions, some of which are not known, but at the same time is only a relative term; for if a few bacteria only are introduced into the body, no untoward result may follow, but if large quantities are introduced the result may be disastrous.

But immunity may be *acquired*, *i.e.*, produced artificially. For a number of years persons are rendered immune to small-pox by vaccination, and so in many other diseases, *e.g.*, diphtheria and plague. Immunity may also be induced by previously bringing on a mild form of the disease.

The first duty of a Sanitary Inspector on becoming aware of an outbreak of infectious disease is to visit the house and make an examination of the interior and exterior in a manner described last week by Dr. Cameron. But let not the Inspector rely on a Compulsory Notification Act to give him the information, for some cases are not notified at all, on account of the absence of medical attendance, and such cases are frequently the starting-point of an epidemic which afterwards gives trouble. Having become acquainted with the existence of a case of infectious disease, inquiry should be made in the neighbourhood to find out if there exist other cases in the district, and very frequently the School Attendance Officer can give valuable information in this respect.

Always look to the water supply, for this is fre-

quently the cause of illness, particularly in country districts.

The school attendance must be ascertained, together with any such important fact of there being a considerable number of children away from a particular school from the same illness.

You should inquire closely into the milk supply, for milk is a very potent medium in the spread of infectious disease. Epidemics of scarlatina, enteric fever, and diphtheria are frequently caused by infected milk supplies. You must, of course, make inquiry as to the method of excrement disposal, whether it be by water-closet or privy midden; the conditions of sinks, gullies, and drains. Finally you should be on the alert for the existence of nuisances due to the keeping of animals or accumulations of filth.

Another set of duties relates to the isolation of the infected person and the final disinfection of the house. In the matter of isolation you must exercise tact and discretion. Remember that an Englishman's house is his castle, and that undue interference is likely to be resented. Never enter a bedroom of a sick person; it is not necessary, and any information you require can be got without doing so. In some cases, such as one-roomed dwellings, one must enter the bedroom, but in houses consisting of several rooms it is not advisable to do so.

Ascertain whether some one person is told off to look after the patient, and whether the necessary precautions are taken to prevent this person mixing with other people. You should give instructions as to the proper use of disinfectants, and how to treat infected articles. Give detailed instructions in full. I think the best method is to leave a printed bill, but be sure the advice contained in it is put as concisely as possible, for if the bill be a long one people will frequently not take the trouble to read it.

Other points are to find out with whom the patient has been associating since he became infectious, and keeping these under observation for the necessary period of "quarantine;" the presence in the house of books belonging to a public library, which should be removed and destroyed, or disinfected.

If your inspection has led you to suppose that there is any condition which is unsatisfactory, you should issue proper notices to secure the abatement of the nuisance or nuisances, and see that the terms of your notices are complied with.

All the remarks I have hitherto made, whether as to the discovery of the cause or the prevention of the spread of the disease, have had reference to facts coming under your notice as a result of the first visit. But you have afterwards to keep an eye upon the invaded house for a variable time. If the patient is being treated at home you may have to pay visits for a good many weeks, and those visits should be regular and frequent. It is impossible for me to say how frequent, because that will depend upon the particular disease, upon the precautions that are being taken, and upon the likelihood, in your judgment, of your instructions being properly carried out. At any rate, they should be regular and sufficiently frequent to ensure your seeing how your directions are attended to, and I think you will do well to remember that the time when you ought to make these visits oftenest is towards the *end* of the infectious period, for after two or three weeks people begin to be careless. Every subsequent visit is advantageous, not only in the way of enabling you to see if your instructions are being carried out, but also by enabling you to find out if any further cases have occurred in the same house. You should always make quite sure that if there is any further occurrence of the disease it does not escape your notice.

Lastly, you have to perform the final disinfection of the invaded house.

DISINFECTION.

The process consists in the killing of the various micro-organisms, which are the cause of infective diseases. No process can be considered efficient unless it is a real germicide, and not an agent which will merely prohibit temporarily the growth of germs. A bad disinfectant is worse than none at all. I am afraid that in the popular estimate a disinfectant is often considered to be a substance which, by its own powerful smell, will disguise an odour which is more offensive. This is not disinfection, and the agent used should be spoken of as a "deodorant," but not a "disinfectant."

The principal forms of disinfection are three, viz.:—

(1) *Heat*, by hot air, steam, or boiling.
(2) *Chemicals*, in solution or powder.
(3) *Fumigation*, by gases or vapours.

Let us consider fumigation first. This is generally done by the production of sulphurous acid, or chlorine, the most common method being the burning of sulphur in a room after the doors and windows and various other openings have been sealed up. In all probability the sulphur fumes have no effect unless the atmosphere has first been moistened by a steam spray. This method has the disadvantage of spoiling any bright metal work which has not been covered by greasing—a prevention which should be taken before fumigation with chlorine or sulphur. A convenient quantity of sulphur to burn is 1 lb. to 1000 cubic feet. Although, as I have said, the burning of sulphur may have little or no direct effect in disinfecting living organic matter, I am not prepared to recommend the abolition of this time-honoured practice, for the indirect effect of the process is certainly great. The stench created by the sulphur is so disagreeable that people are compelled to keep open the door and window of a fumigated room for a long time, and so let in an abundant supply of fresh air, which is one of the most efficient of disinfectants.

A similar fumigation may be made by liberating chlorine gas from bleaching powder, but large quantities of chlorine are required to produce even a slight germicidal effect.

The best method of disinfecting the walls of a room which has recently been occupied by a sick person is the production of a disinfectant solution in the form of a fine spray. This can easily be done by the Equifex sprayer, a convenient apparatus which can easily be carried in the disinfecting van and worked by one man. The material generally used is formic aldehyde (formalin) vapour of the strength of about $\frac{1}{2}$ per cent.; or, if preferred, corrosive sublimate solution about 1 part in 1000. I have used formalin with good results.

Disinfection by chemicals in solution appears to be a very simple matter, and, provided the materials are used in suitable strength, no doubt is so. But not unfrequently the solutions used are too strong. You must remember that the desired effect is the destruction of living organisms, which consist of albuminous matter, and that the object of the chemical substance is to penetrate their interior. If, however, the solution of the disinfectant be very strong, the exterior of the germ becomes coagulated and resists any further soaking into the substance of the organism, so that practically no disinfection takes place, for the organism is not killed but only temporarily put out of action. On the other hand, you must not have the solution too weak. I find a solution of 5 per cent. carbolic acid, or of mercuric chloride (1 part in 1000) to be efficient disinfectants. This method of disinfection is convenient for such articles as sheets and blankets that have been soiled by infective matters. In all well-regulated hospitals such things are soaked for a few hours in some disinfectant solution before being sent to the laundry.

Disinfection by the sprinkling of powders is peculiarly applicable to surfaces that have been fouled by the

scattering of offensive organic matter. Apart from the deodorant qualities of such powders, their method of action consists in the evolution of some oxidising agent on the application of moisture. There remains for consideration, therefore, the method of disinfection by heat, the simplest application of which is boiling, which can be applied to most of those textiles usually cleansed by washing with water. But many articles, such as bed-hangings, and articles of clothing, curtains, cannot be boiled, and there remains for these the process of disinfection by hot air or steam.

Hot air.—Until some twelve or fifteen years ago, disinfection by steam was rarely done, the apparatus in use being the hot-air disinfector, the heat, as a rule, being supplied by a series of atmospheric gas burners. The objections to the hot-air apparatus are:—

(1) It is not an efficient disinfector, the temperature required to disinfect by hot air being much higher than that required in a steam disinfector.

(2) That this temperature is so high that most fabrics are destroyed by it.

(3) That air is a bad conductor of heat, consequently the time required to disinfect by no air is unduly great.

(4) Hot air does not possess the penetrating power of steam, so that although it may destroy organisms on the surface of an article, it cannot be relied on to destroy infection at any depth below the surface.

Hot air must never be employed to disinfect fabrics. Its use should be entirely restricted to the disinfection of articles such as leather goods, which are destroyed by the action of steam.

However, in modern disinfecting stations disinfection is carried on by means of steam. Now, in order to explain the action of a steam disinfector, I must remind you of two or three simple physical facts:—

(1) The boiling point of water, and consequently the temperature, varies with the pressure.

(2) The water in passing from its liquid form into steam absorbs a large amount of heat, which heat is again given out when steam is condensed into water.

(3) That under pressure steam may be heated considerably above the boiling point, viz.: 212 deg. Fah., when it is so called "superheated" steam.

(4) That steam under ordinary atmospheric pressure becomes condensed on coming into contact with a comparatively cold object. This is saturated steam.

(5) That superheated steam on coming into contact with a cold object may be reduced in temperature, but not sufficiently so to make it condense and give up its latent heat.

The behaviour of steam vapour and steam gas in reference to disinfection has been so well described by Mr. Defries, that I cannot do better than quote his description. He says, "It has been found to lie in the entirely different properties possessed by steam, both in its given killing power and the rapidity with which it will carry heat through itself and through persons' bodies, according as it is a gas or a vapour. I use these terms as approximately describing the two forms in which steam may exist."

A gas proper is, of course, the vapour of a liquid of which the boiling point is substantially below its actual temperature, and a vapour proper is the vapour of a liquid of which the boiling point is near such temperature. One obvious consequence of this fact is that a gas proper may be considerably cooled without condensing, while a vapour proper will condense on a very little cooling. When water becomes steam it is accordingly a vapour; but supposing that vapour is further heated, it will not condense until it has lost the whole of the heat so added, and in the meantime is found, in fact, to behave approximately like a gas proper.

The chief discrepancies in the results obtained by steam disinfection are due solely to the difference in the properties of steam vapour or saturated steam, and steam gas or superheated steam.

It will be seen, therefore, that with jacketed machines, which are worked with a higher pressure in the jacket than the chamber there is a danger of having the steam superheated, and in consequence delayed and inefficient disinfection.

There are other disinfectors, *e.g.*, Dr. Thresh's, which are worked with steam continuously passing through the chamber and therefore not under pressure at all. This machine consists of a disinfecting chamber surrounded by a boiler containing a solution of chloride of sodium conveyed through a ball cock from a service cistern. The steam which is formed at the top is conducted down from the cylinder and admitted to the disinfecting chamber at the bottom, being allowed continuously to escape. The object of the chloride of sodium is to obtain a higher temperature in the steam than would be got from pure water at ordinary atmospheric pressure.

VENTILATION.

The object of ventilation is to supply a proper amount of fresh air without causing a draught. Ventilation is *external* or *internal*.

External ventilation refers to the movement of air about houses, the manner in which such movement is interfered with by the proximity of buildings, also their height and the narrowness of streets.

Should external ventilation be defective, it is almost impossible to obtain the internal ventilation of a dwelling properly. Dwellings built back to back, as is commonly the case in Lancashire and Yorkshire, are exceedingly difficult to ventilate, owing to the impossibility of there being any through current of air.

The amount of fresh air which should be supplied to each person in a room continuously occupied is 3000 cubic feet per hour, so that if the room contains 1000 cubic feet, the atmosphere must be changed three times in the hour.

The composition of air—nitrogen, 79 per cent., oxygen, 20.96 per cent., and 4 volumes in 10,000 of carbonic acid, when the atmosphere of a room contains more than two volumes. In addition, as the result of being occupied, it becomes foul, and limit of permissible pollution is reached.

Many examples of apparatus for ventilating rooms were shown by means of lantern slides, the simplest, and the one generally recommended for ordinary sash window frames being the Hinckes-Bird ventilator.

QUESTIONS.

The following questions were asked by members of the audience, and answered by the lecturer from the platform:—

Q. Can typhoid excreta be safely buried in an ordinary cottage garden, and at what depth? How soon would it be safe to dig the garden?

A. Yes; about 2ft. In about two months.

Q. Is continued fever a mild form of typhoid?

A. No.

Q. How many years may typhoid germs continue to live (1) in soil saturated with discharges, (2) in an old disused rubble drain, (3) in a house imperfectly disinfected?

A. (1) For an indefinite period; (2) a long time; (3) several months.

Q. Is it not better to burn typhoid stools than to bury them?

A. Yes; if it can be done.

Q. Should the fumigation of rooms by sulphur not be

discontinued if not effective? What should take its place?

A. Yes; spraying the wall with formalin.

Q. Is it necessary to fumigate with sulphur after typhoid fever, and to disinfect bedding, &c.?

A. Some form of disinfection should be done after every case, but a formalin spray is better than sulphur. All soiled bedding, &c., should be disinfected by steam.

Q. Should rooms recently occupied by cases of puerperal fever or erysipelas be fumigated?

A. Either fumigated or sprayed with formalin.

Q. Would it be better to place typhoid excreta in special tubs provided by the Sanitary Authority than to put them down the water closet?

A. No; the sooner they are disposed of the better. If there be a privy midden instead of a w.c., the special tub should be used.

Q. Will sewer gas emanating from open grates in the street give diphtheria to children playing over them?

A. I think it may.

Q. What cubic space is recommended in hospitals and cottage houses?

A. In hospitals 1500 cubic feet. In cottage houses not less than 300 cubic feet per head.

Q. Do you consider back-to-back houses built in continuous rows with the sanitary conveniences next to the street unhealthy?

A. This style of house has the fault common to all houses built back to back, viz.: absence of through ventilation; otherwise the houses are as good as houses on the back-to-back system can be.

Q. Do the building bye-laws in Bradford prohibit back-to-back houses?

A. Yes.

Local Government Board Reports.

The Medical Officer's Annual Report.

Each year the report of the Chief Medical Officer of the Local Government Board increases in bulk, and proves that the work of the department is ever widening in its importance. The one recently issued, although bearing the signature of Dr. Power, has little to do with his work, for it deals with the closing period of Sir Richard Thorn Thorne's officership, which was so suddenly brought to a close in December of 1899. For this reason it appears to us that it lacks the stamp of individuality we have been so used to under the old *régime*, and which doubtless will be again present next year, when Dr. Power deals with events coming directly under his own supervision. The death of Dr. Thorn was not the only loss the department sustained, for in March, 1900, it lost Dr. Robert Cory, who for many years had been Director of the Board's Animal Vaccine Establishment.

It is still disappointing that the full vaccination statistics are over three years in arrears. If Dr. Power can devise means for expediting these important returns he will do a good public service, for really we cannot understand why they should be so much behind. We are told there were 927,518 children born in 1897, and of these 62·4 per cent. were returned as successfully vaccinated, 11·2 per cent. as having died unvaccinated, 0·3 per cent. as "insusceptible," and 3·4 per cent. as having had obtained "for them (under the Act of 1898) certificates of conscientious objection." This latter appears a little mysterious. Seeing that the Act was not passed until the autumn of 1898, and until that the "conscientious objector" was unknown, how could these certificates be granted? Accepting these figures as correct, however, there still remains 22·7 per cent. as "postponed, removed, or not to be traced," and this is the highest percentage yet recorded for England and Wales.

Other vaccination statistics refer to 1899. During this period 1461 vaccination districts were visited by Medical Inspectors, and out of 1461 vaccination officers, 1083 were recommended for grants. In the same period 499,281 capillary tubes of glycerinated calf lymph were issued in response to 47,097 applications from public officers. This number appears to have been far in excess of the expectations of the officers, for the provisional arrangements at the Animal Vaccine Establishment, at the Jenner Institute of Preventive Medicine, and at the National Vaccine Establishment, for the production, testing, preservation, and distribution of glycerinated calf lymph have, notwithstanding the extension of them referred to by Sir R. Thorne in his last report, proved inadequate. Accordingly, at the close of the year 1899-1900, negotiations were proceeding for setting up the several establishments on a wider and more satisfactory basis.

The administrative work of the Department was of a very extensive character. Quite a number of conferences between the officers and representatives of various Authorities were held in London. These were found to be most valuable, and proved the means of effecting considerable reductions in expenditure by the launching of ill-considered and impracticable schemes. Over sixty inquiries were held in regard to proposals as to hospital provision and accommodation; whilst several other districts were visited with reference to the provision of disinfectors, the erection of mortuaries, and the adaptation of bye-laws to local needs. Joint inquiries by Engineering and Medical Inspectors, with regard to schemes for sewage disposal and water supply, were held in more than a dozen places, whilst the scavenging arrangements of several others were brought under review.

Inspections were made with regard to the incidence of disease and to questions concerning local sanitary administration in various localities, namely: As to diphtheria at Aberdare by Dr. Thomson, and at Aldershot by Dr. Reece; as to enteric fever at Bilston and Coseley by Dr. Mair, at Chichester by Dr. Thomson, at Coleford by Dr. Fletcher, at Falmouth by Dr. Buchanan, at Heanor, Ilkeston, and parts of the Basford rural district by Dr. Wheaton, and at Shirebrook (Blackwell rural district) by Dr. Copeman; as to scarlet fever at Norman Cross by Dr. Bruce Low, and at Walmer by Dr. Sweeting; as to anomalous illness at South Witham (Grantham rural district) by Dr. Bruce Low; as to small-pox at Hull by Dr. Johnstone; as to suspected ship-borne plague at Liverpool, and as to alleged fatal plague at Suffolk by Dr. Bulstrode; as to sanitary circumstances and administration in the borough of Windsor by Dr. Bulstrode; in the urban district of Consett by Dr. Wheaton; in the urban district of Idle, and the rural districts of Braintree, Chelmsford, and Tendring by Dr. Fletcher; in the rural districts of Axminster, Biggleswade, and Chailey by Dr. Mivart; in the St. Dogmells rural district, and in the Dartford registration district (comprising Bexley, Erith, and Dartford urban districts, and Dartford rural district) by Dr. Sweeting; and as to the permanent constitution of the Manchester port sanitary district by Dr. Reece. Many of the reports on the above inquiries have already been referred to in our pages.

Following this general summary of the work of the Department, Dr. Porter proceeds to make special reference to some of the auxiliary scientific investigations carried out during the year, reports of which appear in the appendices. Some of these we may refer to in future issues.

National Health Society.

OFFICIAL TRANSACTIONS.

Examinations for the Diploma.—We have much pleasure in adding two names to our list of diplomées—Mrs. Fisher and Miss A. E. Biggs having successfully passed examinations on Nursing and Physiology (held recently by Mrs. Latter and D'Arcy Power, Esq., F.R.C.S., respectively), thereby completing the full course of training and examinations required for the diploma. Miss Madeleine Stampa has also successfully passed the examination on Nursing for the diploma.

ASSOCIATION OF NATIONAL HEALTH WORKERS.

On Thursday, May 9th, Dr. Robert Bowles lectured to the Association on "The Proper Management of the Physical Relations of the Tongue, Mouth, and Throat in Various States of Unconsciousness."

Dr. Bowles prefaced his lecture by shortly describing the elementary anatomy of these parts, indicating particularly that the tongue, being attached to the lower jaw by its mucous membrane and its muscles, has its relations with surrounding parts altered as the mouth is opened or closed. When the mouth is closed the horizontal portion or body of the jaw forms nearly a right angle with the spinal column, from which the symphysis is then at its greatest distance. When the mouth is opened by the dropping of the jaw, the symphysis describes the arc of a circle and approaches more nearly to the spine, where the posterior wall of the pharynx is attached. The tongue having its chief attachment to the symphysis, would consequently be drawn away from the pharynx in the former case, and allowed to rest in contact with it in the latter. These facts were made perfectly clear by two diagrams of a subject lying on its back on a table. In the first diagram the mouth was closed, in the second it was open. The dissection from which the drawings were taken was made on the body of a patient aged sixty, who died of cancer of another portion of the body, great care having been taken not to displace the parts more than was necessary to give a fair view of the base of the tongue and the epiglottis. When the mouth was open, and the subject on its back, the road to the larynx was completely obstructed, in consequence of the tongue resting in contact with the back of the pharynx; but the obstruction could be removed by hooking the base of the tongue forward. When the mouth was closed, the tongue was lifted from the pharynx, leaving ample breathing space. But even with the closed mouth, if the chin were much bent on the sternum, the base of the tongue was almost in contact with the back of the pharynx. From this dissection it would seem that the muscles of the tongue attaching it to the symphysis of the jaw are too short to admit of the base of the tongue reaching the back of the throat when the mouth is closed and the chin is well away from the breast bone. This dissection also suggested the necessity of caution being used in raising the head with pillows, for if the head be too much bent forward on the chest, the tongue may lie in dangerous proximity to the pharynx, even when the mouth is closed.

Several varieties of stertor may be recognised: (1) Nasal stertor, arising from approximation of the alæ nasi towards the septum by the in-going air, as in the act of sniffing. (2) Buccal stertor, due to vibrations of the lips, and puffings and flappings of the cheeks during inspiration or expiration. (3) Palatine stertor, arising from vibrations of the soft palate, whether the breath passes through the mouth or the nose. (4) Pharyngeal stertor, caused by the lolling back of the base of the tongue into near contact with the posterior wall of the pharynx. (5) Laryngeal stertor, referable to vibrations of the chordæ vocales. (6) Mucous stertor—a term which may be given to the bubbling of air through mucus or fluids in the trachea.

The dangers of the supine position in apoplexy are, (1) The falling back of the tongue, causing sudden and complete apnœa. This may occur in all cases of paralysis, whether from syncope, apoplexy, concussion of the brain, chloroform poisoning, suffocation from carbonic acid, or drowning. (2) Fluids or other foreign matters may be drawn into the larynx from the mouth and stomach. In convulsions of children there is often a large flow of saliva and secretion in the bronchial tubes. This becomes immediately churned into foam, and greatly impedes respiration. In the lateral position all this drains away, the breathing is freed, and recovery often commences immediately. In epilepsy the fit will often cease at once by removing the stertor by turning the patient on to his side; little mechanical contrivances are also necessary to oppose the spasms of the mouth, tongue, and fauces.

Drunken men put into cells overnight are occasionally found dead in the morning; while still unconscious they have been a little sick, as they are in the supine position, the vomit goes down the bronchial tubes and causes death by suffocation. Had they been placed in the lateral position, the vomit would have dribbled out of the mouth and the respiration have been left unimpeded. At an autopsy of a drunken man who had died from symptoms of suffocation, some of the contents of the stomach were found in the bronchial tubes.

In syncope, too, the lateral position is important, although the respiratory disturbances in this instance are secondary to heart failure. The tongue and its attached muscles become in effect paralysed, and therefore subject to the ordinary laws of gravitation. In syncope as in every other form of unconsciousness the air-ways must be jealously watched, and every possible obstacle to the free and easy entrance of air must be removed.

The Committee of the Royal Medical Chirurgical Society on Drowning came to the conclusion "that it was the entrance of fluid into the lungs, and the effects thereby produced, which was the cause of death in drowning." In drowning it is necessary to evacuate the water from the lungs and to provide for the introduction of fresh air by artificial respiration. Dr. Bowles contended that there is no known method equal to that of the Marshall Hall method.

The patient is placed in the prone position and the ribs firmly pressed so that the air in the lungs is squeezed out, and fluid can escape by the mouth. He is then turned on to his side, the ribs on the upper side expand and air drawn in. He is then placed on his chest and pressed upon as before. These semi-rotation movements, prone and lateral, are repeated fifteen times a minute; care must be taken that the patient is always turned on to the same side, preferably on the right. In 1861 a woman who had been taken out of the Serpentine, and treated by the hot bath at the receiving-house, was brought to St. George's Hospital about one hour afterwards. On admission "her breathing was fair, with loud rattling noise; her lips were livid, her pulse very good, her surface and extremities very cold; she was sensible, and able to speak." Warmth and appropriate measures were employed; but in half an hour the resident Medical Officer was summoned, and only arrived just in time to see her draw her last breath. The Marshall Hall method was immediately employed for half an hour without the slightest signs of recovery, but a large quantity of frothy fluid came from the mouth. At the post-mortem examination next day it was reported that "both lungs contained an immense quantity of frothy fluid; the bronchi were filled with fluid and injected." In this case the lungs were loaded

with and paralysed with water. Dr. Bowles argued that had the Marshall Hall method been used earlier it would have unloaded the lungs, and had the patient been placed on one side, on her arrival at the hospital, the upper lung would have cleared and acted quite sufficiently to sustain life. A lung containing frothy fluid does not clear immediately; the belts of foam must gradually coalesce and ooze slowly away, and to assist this nothing is more adapted than the Marshall Hall method.

Dr. Trollope, of St. Leonards-on-Sea, was called to a man who had been taken out of the sea. The man could speak a little, and vomited a quantity of water, but he rapidly became worse, insensibility came on, the breathing was slow and faint, and the pulse flickering. The Sylvester method was being used, and Dr. Trollope persisted in it for some few minutes. "Meanwhile," Dr. Trollope reports, "his respiration had ceased, beyond a slight mucous rattle in his wind-pipe, his heart's action could not be felt, jaw clenched and lips livid. . . . I then, finding these symptoms supervening in spite of the persistence in Dr. Sylvester's method, immediately had recourse to Dr. Marshall Hall's prone and postural, or 'ready' method, and was gratified to find fluid escape from the mouth each time the body was laid on the chest, and respiration gradually set up, commencing with long-drawn respirations, or rather gaspings, at intervals. I persevered in the prone and postural movements for three quarters of an hour, till respiration was thoroughly and satisfactorily established. The man then again vomited between a pint and a quart of water, and was afterwards able to swallow a few tablespoonfuls of tea and went on satisfactorily."

Dr. Bowles insisted then on the following principles: (1) That palatine, pharyngeal, and mucous stertor are the result of a mechanical condition—a condition which may always, and at once, be changed to the great relief of the patients, and sometimes to their permanent recovery. (2) That it is necessary to keep the patient on one side, that that side should not be changed, and that the paralysed side should be downwards. (3) That mucus and other fluids gravitate into and fill up the lower lung, and, therefore, that if the sides be reversed, the mucus will find its way into the opposite lung. (4) That the fluid, crossing from the large bronchi of one lung to those of the opposite, becomes churned into foam and causes dangerous obstruction to the respiration. (5) That the lung, by remaining inactive and filled with mucus for a long period, is not injured.

RATS AND THE SPREAD OF PLAGUE.

By D. S. Davies, M.D., Port Medical Officer of Health, Bristol.

Plague is a disease resembling, perhaps, typhus fever more than any other home disease in its method of spread from person to person by direct infection. It finds a suitable home, as does typhus, in localities whose insanitary condition connotes overcrowding, poverty, and stagnant air—conditions favourable to the intensification and transmission of the specific poison. If this were all, the method of medical inspection, isolation, and forward notification, would suffice to prevent its introduction, or at least to stamp it out before any serious spread occurred. But recent study of the disease has shown that plague is epizootic as well as epidemic; that is, it affects certain animals rats especially) as well as man, the two infections run together, and thus two epidemics have to be fought simultaneously, one above ground, the other below ground.

The disease has been observed in recent epidemics to spread slowly at first, but always with a tendency to get "set" in a place; sometimes, after apparent subsidence, to re-appear in a fresh quarter (due to migration of affected rats); and in India at any rate, to defy extinction over a series of years. Since its advent in India in 1896 it has caused over a quarter of a million deaths.

Rats have been demonstrated to have direct relation to the spread of plague by Yersin, Hankin, Cantlie, Simond, Weir, Surg. Col. Bainbridge, Dr. Doriga, Dr. Calmette and others. The following is a brief *résumé* of the chief facts:—

(1) Kitasato, Yersin, and others have found the specific bacillus of plague in the dead bodies of rats and mice, collected in houses in which cases of the disease subsequently broke out among the occupants, or in the streets of infected towns. They have also placed beyond question the great susceptibility of these rodents to the bacillus.

(2) In all the infected towns of India, manifest examples of contagion from rats to men have been observed. At Bombay, in certain establishments where the dead bodies of rats were found, it has been noticed that the persons who collected them alone contracted plague, although many other workpeople were engaged at the same place.

(3) The first cases of the disease have sometimes appeared in warehouses where wheat, cotton, seed, or other substances likely to attract rats were stored. At Kurachee, where the warehouses are situated in streets without dwelling-houses, the first sufferers were the caretakers.

(4) Well-constructed and well-maintained houses, *i.e.*, where rats cannot find harbour, nearly always remain free from plague. On the other hand is to be observed the permanence of infection in the houses of poor natives, notwithstanding the removal of the residents and furniture and the most rigid disinfection, because of re-infection from infected rodents.

(5) The epidemics at Bombay, Kurachee, and Karod were chiefly localised in quarters where the disease had broken out among rats. The spread of infection in other parts of these same towns was regularly preceded by the immigration and death of rats, and its diffusion always corresponded to the route of travel taken by these rodents in their migration.

(6) In healthy countries adjoining infected, the disease broke out amongst the inhabitants without the importation of a single human case, but was preceded by the immigration of rats from an infected place.

(7) In many countries and towns the development of the epidemic among the inhabitants followed a month after the importation of the first cases, or after the death of fugitives arriving from infected localities. During the interval the plague had been propagated by rats or mice.

(8) The mode of infection and propagation of plague on certain ships proved that the rats on board had been the vehicles of contagion.

(9) A well-demonstrated connection exists between the plague of man and that of rats or mice. The same specific agent (the Bacillus Pestis) is the cause of each. It is communicable from rat to man or man to rat. Either one or the other may be the vehicle of contagion from place to place. Although the transference of infection from a sick man to a healthy man does occasionally occur, the rat seems to be the chief and almost necessary agent of the epidemic diffusion of the plague.

The rat is far more dangerous than the mouse, because of its migratory instinct, which becomes an uncontrollable scourge, carrying contagion into distant quarters of a city or into adjacent countries.

NECESSARY MEASURES OF PRECAUTION.

(1) Owners of riverside warehouses and granaries should make systematic effort to exterminate rats. The mongoose is stated to have proved useful, or the pro-

fessional ratcatcher may be engaged. In some districts the rats have been inoculated with a coccobacillus (Danysz), which is fatal to them, but harmless to domestic animals. The action of this coccobacillus seems to be very uncertain, and its success to depend much upon the freshness of the culture, and partly upon the resistance of the particular species of rat. Special inquiry is being made as to its use.

(2) Shipowners should note the possibility of infected rats being introduced from infected ports, and adopt precautions when loading at such ports: (*a*) The mooring cables should be guarded by special conical collars. (*b*) Footbridges should be raised during the night. (*c*) Before loading, the absence of rats should be ensured, by trapping, poisoning, or fumigation; dead rats should be burnt.

(3) On arrival, the practical difficulty is to destroy the rats (which can only be reached by fumigation), without injuring the cargo. Ratcatchers are occasionally employed, and a price given for rats caught; discretion must be used not to encourage importation of rats to secure the reward.

We have found fumigation with sulphurous acid gas effectual in destroying the rats in the closed hold; but this can only be used after the cargo is cleared out.

Dr. Calmette, who was sent by the French Government to investigate the recent outbreak of plague in Portugal, has given an interesting account of his mission to the Société de Médicine Publique in Paris. He preaches a crusade against rats and mice as a measure of prevention. The French Government has already taken steps for the destruction of these rodents in ships arriving from plague-infected ports.

Dr. Calmette recommends that the discharge of cargo, especially grain and cotton, from places where plague exists, should be strictly forbidden till after the most rigorous inspection has been made. Bales and sacks should be opened and their contents emptied out and examined. If any dead rats are found, the whole must be destroyed without the ship being allowed to touch the quay. Further, a war of extermination should be declared against rats at home. A price should be put upon their heads, and he suggests that 50,000f. (£2000) be voted for the purpose. A capitation grant of 10 centimes, or 1d. per rat would ensure the destruction of half a millon rats.

In Denmark a campaign is already being carried on upon these lines. A price was put upon their heads, and an official report of the progress of the campaign in Copenhagen is issued weekly. In the first week the number was 6000, in the second 6616, in the third 6780. More recently the number has risen to 10,000. Other towns and communes have followed this example, and it is hoped that in no long time the rat will be extinct in Denmark.

In Russia a similar war has begun. At Odessa the following device to protect passage of rats over mooring ropes, has been used. The cable is run through a piece of iron pipe about a foot in length, and welded on the end of the pipe is a flange, a funnel which resembles the end of a trumpet with the wide end facing the ship. The iron pipe is stuffed with oakum to prevent slipping, and to prevent rats from passing through it; this is fixed on the ropes close to the ship.

THE ATTITUDE OF SHIP OWNERS AND SHIP MASTERS.

The measures necessary to rid a ship of rats are very simple, and a thorough fumigation with sulphur of the whole ship's interior when empty will practically suffice. The treatment of hold and cabin spaces must be simultaneous, as the vermin simply go from one to the other if the fumigation is partial, and so escape suffocation. In order to secure this thorough and simultaneous fumigation it is necessary that the ship should be in the hands of the Sanitary Authority, empty, for at least twenty-four hours. Many owners are unwilling to lay up a vessel even for this short time, and, in the absence of any evidence of infection, no compulsion can be applied.

The use of carbonic oxide, on which experiments are at present being made, would be yet more effective.

Until plague showed a tendency to its recent pandemic extension, cholera was the only exotic disease that seriously threatened Europe; as this is a distinctively human disease, the presence or absence of rats on ship-board was of slight moment.

But in the case of plague, which has been shown so clearly to be frequently rat-borne, the case is far otherwise; and communities have a perfect right to protect themselves against a danger which is recognised and preventable.

If shipowners can, at little inconvenience and small cost, rid their ships of rats, and by the exercise of due vigilance when loading at infected ports, do much to prevent infected vermin from gaining access to their ships, they should undoubtedly be under an obligation to do so; nor should they be privileged to introduce an unnecessary danger into home ports, or merit compassion because they suffer some inconvenience or loss when the presence of infection, which they should have prevented, is discovered.

It seems curious, too, that such definite precautions should be universally enforced against non-living infective material, such as clothes and bedding; whereas living infective material, endowed with locomotion and of migratory instincts, is allowed unrestricted importation.

It would result in a saving, not only to the health or lives of the crew, but also to the pockets of the merchants, if shipowners were compelled to take simple measures of precaution on the lines indicated; nothing can be more wastefully expensive than an actual outbreak of plague, and "prevention in advance," though less showy, is far more desirable than "stamping out," which involves the permitted introduction of disease.

Some of the difficulty in securing attention to the destruction of vermin on ship-board is no doubt due to the absence of official recognition of this special danger in the plague regulations for dealing with arrivals from infected ports; it is to be hoped that a new order will replace the obsolete regulations of 1896, bringing them up to date and strengthening the hands of Local Authorities, who, at present, are free to do as much or as little as they think fit.

A SPECIAL meeting of the Edinburgh and District Water Trust was held last week to consider a report by a sub-committee of the Works Committee in reference to the Provisional Order, 1901, of the Trust. Lord Provost Steel presided. The Trust met in private, and at the close of this sitting the reporters were admitted. The Lord Provost then formally moved the approval of the report which was in print. Mr. Archibald seconded, and the motion was agreed to. The Provisional Order provides for an extension of the time given by the Act of 1895 for the completion of the Talla works. The date for the completion is now fixed at 1908. The formation of the sinking fund is in like manner postponed for other three years; and power is taken to borrow an additional sum of £200,000. The report relates that the accountant of the Scottish office had raised some points as to the sinking fund contribution and as to the compulsory purchase of the perpetual annuities in favour of the old water company in the year 1870. A meeting ultimately took place at Dover House, when it was agreed that after five years from the completion of the Talla works a fund should be accumulated out of revenue at the rate of £2000 a year, to be increased to £4000 a year after ten years, towards the extinction of the water annuities above referred to.

CONCRETE SUBWAYS FOR UNDERGROUND PIPES.

At a meeting of the Society of Engineers held at the Royal United Service Institution, Whitehall, on Monday evening, June 3rd, 1901, Mr. Charles Mason, president, in the chair, a paper was read on "Concrete Subways for Undergound Pipes," by Mr. Arthur Taylor Allen, of Portslade.

In introducing the subject the author referred to the construction of the first subway in England for underground pipes which took place about the year 1860, in the City of London. This was followed a year or two later by one in the city of Nottingham. He noted the lack of progress there had been in the extension of these new arterial thoroughfares, for, beyond one being constructed at St. Helens in 1898, very little had been done in that direction to minimise the evil resulting from the continuous breaking up of roadways for access to the numerous pipes laid under every thoroughfare. He gave a long list of streets broken up in the course of one year for obtaining access to pipes. He also pointed out the danger and inconvenience likely to arise from roadways being laid over a number of gas pipes, which might soon prove to be of insufficient capacity or become defective, and over water mains that were laid years ago when the water supply was very limited.

The author referred to the sections of the various Acts in force empowering public companies to break up streets after due notice, causing the total or partial blocking of a thoroughfare, interfering with traffic, and operating temporarily to the prejudice of business houses, the owners having no claim for any loss sustained thereby. He then alluded to the increasing number of underground pipes and the possibility of the provisions of the Rivers Pollution Acts being more rigidly enforced, and in the near future throwing upon some Authorities the necessity of separate sewers for surface or storm water. The author then described the subways in London, Nottingham, and St. Helens. To relieve doubt as to the possibility of a severe frost affecting the water mains in the subways, he gave satisfactory thermometrical readings taken in the Albert-street subway, Nottingham.

Turning next to the utility of subways, the author stated that by their construction access could be readily obtained for the purpose of inspection, alteration, or addition to any of the pipes at present hidden and placed beyond inspection. He drew attention to the fact that after works of great magnitude had been undertaken in obtaining a pure water supply, to ensure the health and safety of the population, the pipes conveying the supply were hidden. Thus a defective joint or a burst might remain undiscovered for a length of time, as was the case some years ago when the first intimation of a leakage in the borough water mains was reported to him by the sewer men when repairing a sewer in close proximity to the mains.

An efficient system of detection and prevention of water pollution or waste would be provided for by subways, and the life of iron pipes would be considerably increased. Electric and telegraph wires need no longer run along poles and roof fixtures; they could be put under ground, thus rendering them less dangerous and more reliable and permanent. Having regard to economy of cost, capability of resistance, and rapidity of execution, the author suggested concrete as the most suitable material for such works, and referred to its practical value as exemplified by its extensive use in connection with works in general.

In dealing with subways for large cities and busy thoroughfares where foot passengers experienced difficulty in crossing the street in safety, the author recommended that, in conjunction with the subway, underground conveniences should form a part of the scheme. Entrances would be erected in the centre of the street, so arranged that an easy and ready access (although private) could be gained from the first landing. This might be regarded as a peculiar suggestion, but he alluded to the revenue it was possible for it to bring in, as much as from £200 to £2000 per annum having been cleared as profit for such accommodation.

With regard to subways for suburban districts the author considered all large subways should have lateral ways, about 3ft. wide by 4ft. 6in. high, for the purpose of access and conveyance of gas, water, and other pipes, and he advocated making use of every available space by a specially-designed iron bracket for the pipes. The author submitted a proposal for a subway under each footpath of all new streets to receive the water, gas, and other pipes, the subways to form part of the laying out of the new street. He considered it necessary that the gas and water mains should be in duplicate, the concrete wall nearest the house would be perforated with 2in. and 2½in. holes for the house services, thus obviating the construction and expense of lateral ways.

The sewer would be laid under the road with the usual manholes on the principle adopted in the present day, but with the addition of elongated eyes every 20ft., extending to each subway. The chamber (common to all house drainage) to be constructed in the bottom of the subway by and at the cost of the owner when requiring to connect with the sewer. This method, he contended, would ensure the surface of the road being kept free from interference.

The author gave the cost of some subways constructed in London as £15 per lineal yard, Nottingham £10 per lineal yard, and St. Helens £7 2s. 4d. per lineal yard. He pointed out, however, that the information was of but little practical value, and must be accepted with the greatest caution, it being impossible to make a useful comparison between the cost of construction at other places without a knowledge of the conditions of each case. Although the initial cost would prove heavy, he pointed out that there might be some compensation if the excavated materials proved suitable for the concrete work. The author considered that the cost of constructing subways should be borne by a loan for a period of fifty years, as the works come under the category of permanent works.

THE HOUSING OF THE POOR PROBLEM IN THE METROPOLIS.

By Henry Kenwood, M.B., &c., M.O.H., Borough of Stoke Newington.

It is now impossible for a poor family to obtain two or three rooms in London for the same sum which would have procured them a small house of their own a few years back, and thousands are literally starving themselves to pay extortionate rents.

The Local Authority can do much to promote the most satisfactory standard of sanitation and decency procurable in these highly-tenemented houses, but the standard is one which does not satisfy the least fastidious in scores of cases, and the Nemesis must inevitably follow of a progressive physical and moral deterioration of our London poor. When insanitary conditions, such as we can deal with, arise on these premises, one's natural impulse is not to spare the owner who is responsible for the circumstances which have led to such nuisances, but his general practice is to raise the rents, and make the tenants bear the costs of the improvements. I know of instances in Stoke Newington where as much as 7s. a week is paid for two small rooms, and the demand for such accommodation is so great even at that figure that the condition is imposed that no tenant with

children is received. It is not difficult to see what such a condition of tenure leads up to, and how necessary it is for those who can only afford two rooms to limit their families. This is one of the causes, in my opinion, of the falling birth-rate in our large centres of population. Extortionate rents for poor-class property have a great deal to answer for; they cause a high death-rate, a high infectious sickness-rate (for communicable disease must run through the whole of the susceptible members of the crowded family—if not of the whole house), physical and moral decadence, and the restriction of families. Now, the birth-rate is the chief asset of the State, and this housing question is not only one of local interest and concern, it is a grave national question affecting the health, morals, and vigour of our country. It is the most pressing and important subject which London has to deal with. The remedy of municipalising such property bristles with difficulties, but if it were practicable it would be the most beneficial public health measure conceivable.

Where private enterprise succeeds in dealing with the housing problem it generally only succeeds by tolerating conditions of tenancy which could not be countenanced by a Health Authority, and hence it might well be suppressed; but all municipal enterprise is handicapped by the payment of such exaggerated compensation or purchase money that an excessive expenditure of capital is entailed in any improvement scheme. If a house of £50 a year rental is made to bring in £100 by subdividing it into a series of small tenements in which people are allowed to house themselves like rabbits, then the compensation for expropriation should be estimated on the £50 annual valuation, and not on the £100. The community is now compelled to pay extravagantly for removing an evil for which the owners of slum property should properly be made responsible. Failing the enforcement of responsibility against the slum owner, the Local Authority should have the power to compel the sale of such property at the rateable value of the land and the materials. What is desirable is a reform in the existing law which will make it unprofitable to own hopelessly insanitary property. At present the cost incurred for "compensation" and construction leads to the substitution of dwellings which can only be let at a rental which is too high for the bulk of those evicted, who therefore increase the overcrowding in the adjacent slums.

Slums encourage drunkenness, and, on the other hand, a drunken, thriftless class will produce slums; and if drunkenness, vagrancy, and culpable pauperism could be effectually diminished, one result would be a largely-increased proportion of persons able to pay rent for improved and suitable dwellings.

It will be said that with lowered rents many will still continue to live huddled together and in filth, if they can thereby save something for dissipation. That may be conceded, but when the Sanitary Authority is in the position of being able to say that sufficient accommodation is procurable at such a reasonable rent that the people *can* live wholesomely, then it will be for the Sanitary Authority to see that they do so; and doubtless much of the present day dissipation among the poor is the direct outcome of their miserable homes.

Easy and cheap transport to the outskirts of our large towns would do away to a great extent with the need for the working classes to live close to their work; houses would be cheaper and the children would have a chance of growing up under natural and healthy conditions.

Hitherto the houses erected by public bodies in the metropolis with a view of re-housing some of the population displaced by an improvement scheme have been too expensive (from 2s. to 3s. 6d. per room). The breadwinners in such insanitary and dilapidated property are not as a rule skilled workmen, and most of them, even when the greatest care and economy are exercised, make little more than a bare living wage. To close the houses of such people because they are insanitary, and to offer them other houses at a much-increased rental, and often far removed from the scene of their daily work, is not seriously to attack the difficulty of improving the conditions of life of these people. To build houses that could not possibly be let under 6s. 6d. a week (as is generally the case), is doing nothing for a class of people who were formerly paying but 2s. 6d. The provision of the former class of houses may well be left to private enterprise. They will soon be tenanted by those who are in receipt of fairly good wages, and who are really not the class of people for whom it is so necessary to find improved accommodation. The whole question is, of course, beset with great and serious difficulty, and the present state of our legislation does little to assist in its solution. The problem which has to be solved in the near future by Local Authorities is how to provide healthy houses for poor people of a class that the speculative builder does not provide for.

It is very generally conceded that those in humble circumstances cannot afford to pay more for rent than one-sixth of the income earned. The class which stands most in need of municipal help in the direction of housing is the class which does not earn more than from 20s. to 25s. a week on an average, and these want accommodation at not more than 3s. 6d. to 4s. 6d. a week. Once the supply is equal to the demand, rent would resume a more rational ratio to the workman's wage, instead of the fourth or even third which it often represents at present. If they are going to meet this real want, Local Authorities must not dream of an "annual profit," but will have in many cases to subsidise such provision to some small extent out of the rates. The much desired extension of the period of repayment of loans for land purchase to a hundred years would do much to reduce the financial difficulties attending the great problem of the housing of the working classes.

The London County Council has hitherto done more in the direction of shifting the slum population than of re-housing it under its improvement schemes. The Boundary-street area originally accommodated 5719 persons, but only eleven of these found homes in the too expensive buildings erected upon the old site. The disease was, therefore, intensified, for neighbouring areas became still more overcrowded, and this will continue to be the case so long as the re-housing does not keep pace with displacement.

There must be in the metropolis at present some 500,000 persons ("the submerged tenth") who cannot afford to pay a sufficiently high rent to secure healthy homes. The number of paupers in the metropolis during last year was estimated at 125,000, and the common lodging-houses provide for some 30,000; the balance remaining is a formidable one. It is in the interest of the whole community that these people should be housed sanitarily; but the process is so costly that municipal enterprise is heavily handicapped. It must be cheapened. The rookery sweater has no claim to receive handsome compensation. If it were made unprofitable to own insanitary and degraded property, we should have less of it to menace the health of every community.

THE Water Committee of the Corporation of Liverpool met last week, when it was reported by the Engineer (Mr. Joseph Parry) that during the week ending 25th ult. the quantity of water supplied, within and without the compulsory limits, was 210,263,000 gallons, the daily average being 30,038,000 gallons. In the corresponding week of the previous year the quantity was 185,108,000 gallons, the daily average then being 26,444,000.

FOOD ADULTERATION IN WILTS.

Dr. Bernard Dyer, County Analyst for Wilts, in his report for the quarter ended March 31st last, says:—"I have analysed during the quarter 109 samples of various articles of food and drugs submitted to me by the Inspectors of the county, of which 89 samples were returned as genuine, while 20 were either adulterated or contained some ingredient to which I considered it my duty to call attention. Among the articles of food included in these 20 samples was a sample of margarine containing only about 8 per cent. of butter. This material was, I understand, sold as butter. Ten samples of butter, otherwise genuine, were found to contain boracic preservative, the quantity in two cases being as small as 0·1 per cent., or 1 part in 1000, in three cases about 0·2 per cent., in two cases about 0·25 per cent., in one case about 0·3 per cent., and in two cases about 0·4 per cent. In no case, therefore, was the quantity of boracic preservative so high as ½ per cent. A sample of margarine sold as such was also found to contain boracic preservative, but not more than about 0·25 per cent. We are still awaiting the decision of the Royal Commission appointed to consider the question of the legitimacy or regulation of the use of such preservatives as this in articles of food. A sample of marmalade was found to contain at least 20 per cent. of glucose syrup; a sample of mustard contained 10 per cent. of wheaten flour; a sample of mixed spice contained 4 per cent. of sand or earth—owing, presumably, to the neglect of cleaning the various spices used, some of which are imported in a very unclean condition; and a sample of whisky was found to be 7½ deg. below the lowest legal limit of strength. Among the samples of drugs submitted to me was a sample of quinine wine made up of a strength differing from that directed for the preparation described under this name in the British Pharmacopœia. Six samples of borax were submitted to me. Three of these contained traces of arsenic so small that I considered that the samples might be passed as genuine, having regard to the limitation of the doses of borax which would be given for internal consumption. Three samples, however, contained sufficient arsenic to make it desirable, in my opinion, that the attention of the vendors, and through them of the makers, should be called to the matter. Although even in these cases the quantity of arsenic was insufficient to be of medicinal or physiological consequence, it is well to recognise the desirability of a reasonably high standard of purity for drugs, and, in order that this may be brought about, it may sometimes properly fall within the duty of the public analyst to call attention to impurities which, while not sufficiently grave to cause the sellers of the articles to be classed as offenders under the Sale of Food and Drugs Act, are nevertheless evidences of lack of care in manufacture in a direction which, if exaggerated, might possibly lead to more serious contamination."

THE DECLINING BIRTH-RATE.

In the opinion of Dr. Denning, Medical Officer of Health to the Elland District Council, the steadily dwindling birth-rate is a serious matter. The district which comes under his special care has deteriorated in this respect to a startling extent. Fifteen years ago, in Elland, he says, the population could be estimated, generally correctly, by multiplying the number of inhabited houses by five. At the '91 census it was found to be exactly correct to multiply by four and a-half, according to the returns. Now, from what he has heard, the population will not be more than four times the number of inhabited houses. That is a very big drop indeed. The birth-rate in Elland is much less than in other towns. It is only about 17 per 1000, compared with 28 for the country as a whole. This is a tremendous difference, as he points out, and Elland's birth-rate has been going down for some time. Also, it has been below the average for several years. "The public," Dr. Denning remarks, "look upon this matter as a great joke, but it will soon be an important question. It is a serious thing for the birth-rate to be going down." His conviction is that the present generation of parents are not physically as fit as those who went before them. It used to be a question of the survival of the fittest, but that is not the case now. All the improvements in sanitation and in medical and surgical science have helped to preserve the weaklings, and these weaklings marry as soon as they can, and are more dependent upon someone else than strong people. That, he thinks, has something to do with the falling birth-rate. "You don't see the matronly women and the big powerful men that you used to see." As a country, Dr. Denning says, we seem to be going towards the state of France. A declining birth-rate is becoming general all over the land, and the lowest birth-rate ever recorded was last year's. This does not look very promising for a "dominant" race; it looks, to quote the Doctor's words again, "as if we are becoming a degenerate race." In his report of 1894 occurs this paragraph: "The birth-rate (22·82 then) continues steadily to decrease. In 1891 it was 27; in 1892, 26·3; in 1893, 25·38; and in 1894, the decrease is very marked. Whether this is a sign of deteriorating or advancing civilisation, I know not."

To sum up, Dr. Denning emphasises his remarks on "the survival of the fittest." With the advance of sanitary science, weaklings survive, who before would have died, and left stronger men, to be followed by a stronger race of children. South Africa has found out the weaklings, as the long lists of the disease-stricken show. Here in the busy North, where the air is befouled by belching chimneys, and where "the bleak and sombre grey reigns supreme, and the beautiful and variegated colours and shades which Nature provides for our enjoyment and enlivenment are defaced and rendered hideous by the greed and prejudices of the 'powers that be'" (as Dr. Denning so forcibly expresses himself), narrow-chested men and women are reared at the looms and in the factories. You have only, says the Doctor, to contrast the servant girl with her sister from the mill to see the difference. No doubt physical drill, such as the *Spectator* advocates, would benefit the rising generation, who so sadly need it to develop their bodies and make them strong.

Dr. Wynter Blyth, Medical Officer of Health for Marylebone, in his last monthly report has a reference to plague dangers. He says: "The health officers for the various ports continue to take the addresses of passengers arriving in this country from plague-infected ports, and to forward the same to the various districts to which the passengers are bound. A considerable number of such passengers are supposed to have arrived in Marylebone during the last five weeks, but in about 90 per cent. the addresses cannot be verified. It would thus appear that either the passenger knowingly gives a false address, or that circumstances occur altering his destination. If the Marylebone experience is any indication of what occurs generally, then the matter is one demanding legislation. It is obviously most important that in such a disease as plague all persons coming from an infected locality should be, for a week at all events, under the surveillance of the sanitary officers of any district in which they reside, and it should be incumbent on them to notify to the authorities their movements within the time of possible incubation. This would not interfere with personal liberty, nor should it cause annoyance or inconvenience."

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AN ARCHITECT'S UTOPIA.

IT is only to be expected that the growing interest in the housing question should develop phases of original thought among the community of architects; but, unfortunately, originality of ideas does not always savour of the practical. Some of the suggestions set forth in a lecture delivered by Mr. Raymond Unwin before the Workmen's Housing Council serve to corroborate this view. We have every sympathy with the architect who objects to the so-called model dwelling, with its small and sunless rooms haunted by the ghosts of disease; but at the same time we are fully sensible of the manifold difficulties which Municipal Authorities have to face in providing even this much in the way of accommodation for the working classes. The poetry of health with its ideal stanzas, reminiscent of country cottages covered with honeysuckle and roses, is admirable in its way; but before this ideal is reached there are difficulties to be surmounted which mere theorising alone will never accomplish. When speedier modes of transit become general, and "land grabbing" is extinct, then, and then only, may we expect to see a move in the direction which the visionaries of Utopia would have us take. The suggestion that houses should be made to live in is one that no sane person would for a moment question, and we fail to see anything original in the contention that sunshine and fresh air are essential to the enjoyment of health and happiness. But how to bring these within easy reach of the City toiler is the real question at issue. With Mr. Unwin's suggestion that cottages should be built in quadrangles, and that there should be one common garden accessible to the tenants as a whole, we are decidedly at variance. The idea is opposed to every social characteristic of the Englishman whose house is his castle, and whose ambition it is to possess a piece of ground, however small, into which he can dig and delve at leisure, and where his children can romp and play uninterrupted by the conventional regulations of the public playground. We know too well these "garden spaces in common" with their officious custodians in uniform, and their stern injunctions to "keep off the grass;" and as lovers of freedom we hate and despise them. For the nonce they are essentially a City element, and we sincerely hope they will continue so. The lecturer pictured a place where the domestic cat would no longer have a reserve ground in which to lie in wait for sparrows—rough on the cat, and equally hard on the children, to whom this domestic pet is in many cases a real source of pleasure. But while objecting to Mr. Unwin's separate-garden-abolition scheme, we are heartily at one with him when he proposes to sacrifice ornate architecture in order to spend every possible halfpenny of the cost on a larger living-room. The miserable band-box which has to do duty as a living-room in the modern small house constitutes a disease-producing medium which should be summarily dealt with; but equally important, in our opinion, is the necessity for larger sleeping apartments. The abolition of passages, landings, sculleries, staircases, and recesses, advocated by Mr. Unwin, would be easy were houses built upon the bungalow principle; but here, again, the question of land value crops up. Some day, perhaps, when we are enabled to go whirling through space at the phenomenal rate of speed indicated by recent theoretical experiments, it will be possible to found colonies remote from cities, where the class of house dreamed of by Mr. Unwin will find an abiding place. We are all anxious for that day to arrive, and though we shall not be alive to see it, our children's children may, perhaps, enjoy the heritage. It is,

indeed, fortunate that the professional architect of to-day can find leisure and opportunity to put in a little overtime, as it were, for the benefit of posterity.

"Unhealthy Cannes."

Last week we referred to the very doubtful value of Nice as a resort for invalids. The Paris correspondent of the *Daily Mail* has also placed certain unpleasant facts about Cannes before the readers of that paper. He quotes from the letter of a local correspondent, in which it is asserted that "in spite of local subterfuges to conceal the fact, there is not the slightest doubt that there is an epidemic of typhoid fever in Cannes at the present moment. The wife of the Bishop of Gibraltar is seriously ill, and so is the organist of Christ Church. At the Château St. Michel, belonging to Lord Glenesk, there is a case of typhoid, and other cases are at the Villas Mariposa, Capodimonte, Valletta, Soligny, and Champfleuri. A servant has been removed from the Villa Barety to the hospital, and two domestics from the Villa du Lys are also patients there. A workman employed by Mr. George Russell has died from typhoid; a young man of twenty-eight years of age, son of a neighbour of mine, has succumbed to it; and I know another young Englishman who is down with it. Nearly everyone one meets knows of someone who has been attacked by the fever. In the town hospital there are twenty-eight cases, and one local doctor is said to have admitted that he has forty-eight cases under treatment." In another portion of the same letter we learn that "under the late mayor the consuls were furnished with a list of deaths and all complementary details, such as cause of death, &c. The civic authorities now refuse to give more than the bare list, and as the local papers do not publish complete lists one never knows how many die. I am told, indeed, that two registers are kept—one for public inspection and one which is authentic." It is only right that these facts should be known to the public. In the present day, when the tendency on the part of certain people is to cry up everything foreign and anti-British, it is well to remember that much of this clap-trap is written by those entirely ignorant of what they are writing about. It may be, in the eyes of some, fashionable to go to these places, and a bronzed face may be the outward sign that the "Sunny South" has been visited, but of what use is this if the system has been contaminated with the seeds of fever? With all its shortcomings the old Homeland is after all the safest and best place in the world.

A Strong Indictment.

There is likely to be a lively interchange between the Urban Council of Bishop Auckland and the Local Government Board, as the result of a recently-issued report on the sanitary condition of the district by Dr. S. W. Wheaton, one of the Medical Inspectors of the Board. In his report, of which we propose to give a summary in a future issue, Dr. Wheaton says some strong things about the administrative work of the town. He affirms that the "work of the District Council has always been fitful and irregular; even when their officers have drawn their attention to very pressing and dangerous nuisances they have dealt with them in a spasmodic way, apparently soon subsiding into their normal condition of apathy towards all sanitary work. As the result of long-continued inaction of the Authority, the district now finds itself threatened by a sudden and heavy expenditure for public and private improvements which can no longer be shelved, which expenditure would have been spread over the course of many preceding years if those responsible for local sanitary administration had only performed their duty." He goes on to say that "with respect to the prevalence of enteric fever in the town for so many years, the general sanitary condition of the district is so bad that it is difficult to fix upon any single unwholesome condition as playing a principal part in the spread of fever. On taking into consideration all the circumstances of the distribution and progress of enteric fever in the district, there is presumption that the disease has from time to time been introduced and distributed over the district by means of a contaminated water supply." Altogether this is a pretty strong indictment to bring against any public body, and we naturally wonder what can be said in defence. Pending the meeting of the Council the local papers have commented upon the report, and doubtless the line they take is an indication of that which will be adopted by the Council. The *North-Eastern Daily Gazette* boldly calls the Doctor's findings into question. It asserts that the visit upon which the report was based was "hurried," and that he only made a "hasty perambulation round the town in company with the Sanitary Inspector." And, further, that at the very period when Dr. Wheaton says things were so bad, the County Medical Officer reported a considerable improvement all round.

A Countercharge against the L.G.B.

We do not think, however, much will be gained by this style of recrimination, for at the best it can only be based upon hearsay. We think there is a much stronger case for complaint against the Local Government Board in another statement put forward by the same paper. We are asked to believe that the Urban Council itself has just cause for complaint against the central Board. It is said that when a Local Government Board inquiry was held in response to an application by the Urban Council to borrow a large sum of money to improve the water supply of the town the County Council objected, and the Local Government Board refused the loan. The result is that, despite this opposition, the work has been carried out; but the cost has had to be defrayed out of the current rates, which has imposed a heavy burden on the ratepayers—a burden which is likely to be increased. Then the Local Government Board refused to allow the sewerage to go into the river

a mile and a-half below the source of the water supply. Three or four years before the serious outbreak of enteric the Local Government Board approved of a large sewerage scheme, by which the effluent had to go into the river, the outfall works being near Binchester. Here, again, an insurmountable difficulty arose. The Ecclesiastical Commissioners in the land lease refused to give any guarantee against pitfalls. Under these circumstances the Council felt it would be folly and waste of money to proceed with the scheme, for after spending the ratepayers' money a pitfall, or a series of such, might render the sewage farm useless. As the same public body owns much of the land in that vicinity and district, the difficulties of the Council can easily be recognised. But for two months or more the work of preparing a scheme of sewerage for the southern end of the town has been in active preparation, and there is reason for believing that the plans and estimates were adopted a fortnight ago. "This much," says the *Gazette*, "can be honestly said for the Auckland Urban Council, they are honestly endeavouring to make the town a most healthy one in every respect, and in doing so they are hampered by the antagonism of a section of the County Council and the red-tapeism of the Local Government Board." It is quite likely, as we have already indicated, that more will be heard upon the matter. But it does seem to us that if there had been a little more energy displayed on the one part, and a little patience on the other, the present unpleasantness might have been avoided. In fact, is not this true of all disputes and quarrels?

Clifton as a Health Resort.

When your town has a good record, do not hesitate to make it known. And there are many parts of these isles which are worthy of greater notoriety than they at present possess. But there are very few districts where men can be found with sufficient enterprise to urge their Councils to take steps to bring their claims before the health and rest-seeking public. Even if the Bill some are proposing to introduce this session should become law, we believe that many will hesitate to spend so small a sum as a penny rate upon advertisements. These people are often quoting the proverb about "casting bread upon the waters," but they always think it must be somebody else's bread, not theirs. The Isle of Man and Blackpool owe much of their popularity and success to the attractive advertisements scattered throughout the country, and if others would follow suit much of the holiday traffic passing over to the Continent could be diverted to home channels. Where the municipality will not act, however, the example just set by Clifton might be followed. Here the "Municipal Association" has sent a circular letter to the principal medical men of the county pointing out the splendid health record which the place possesses. It is pointed out that the death-rate for the thirty-three towns was 20·2, in Clifton it was but 12·2. Taking the zymotic diseases, the test is even better. In the towns it is 2·81, in Clifton it is only 0·61. The infantile mortality is also very low—112·1 against 181—and is said to "confirm a popular opinion that it is specially suitable for children." The letter goes on to say that "Clifton is sometimes regarded as merely the residential suburb of a great manufacturing city, but our forefathers were wise in their generation when they made it a favourite health resort. The climate of Clifton is exempt from extreme variations of heat and cold. At the Sea Wall on Durdham Down a fine view of the Bristol Channel is obtained. It may therefore be claimed that the air of Clifton combines the qualities obtained at an inland watering place with those of the air at a seaside resort — an up-channel breeze coming directly from the Atlantic Ocean. The breezy open Downs, 442 acres in extent and 300ft. above the sea level, and the extensive wooded slopes on the Somersetshire side of the river, give to it all the advantages to be gained by restful, quiet, and pure air, while the magnificent scenery of the Avon gorge and the surrounding country is a never failing source of interest." From personal knowledge we can confirm many of these claims.

The Pinewood Sanatorium, Wokingham.

The *Times* has an interesting description of the new consumptive sanatorium at Wokingham, to be known as Pinewood Sanatorium, which is being erected under the auspices of the London Open-air Sanatorium Association, and is now approaching completion. The chief obstacle with most similar institutions is that, being private ventures, the charges for admission place their benefits beyond the reaches of a very large class of sufferers. There are others, on the other hand, which are designed more particularly for the poor. The establishment at Wokingham aims at the mean, and is devised to meet the needs of that large class of the people who are neither very rich no very poor. After the Marlborough House meeting, at which the work of the National Association for the Prevention of Consumption was fairly launched before the public, the London partners of Messrs. Wernher, Beit, and Co. agreed to find £20,000 to build and equip this sanatorium, on the terms that after payment of all working expenses they should receive 2½ per cent. for their money; should the payments of the patients—which have been provisionally fixed at three guineas a head per week—yield any surplus profit after payment of this interest, it is to be devoted to the objects of the sanatorium. The buildings will consist of a central administrative block, with two blocks on each side for the accommodation of patients, all facing almost due south, so as to secure the maximum of sunshine. The two pairs of patients' blocks are connected each with a continuous passage running the entire length of the north side, the bedrooms, of which there are sixty-four in all, being arranged on the south side. The bedrooms are constructed with a cubic capacity of about 1000 cubic feet each, and the south side of the rooms is practically all window, two case-

ments and a fanlight affording the maximum of light and air. A feature of the buildings is that the joiner work is of the simplest possible character, with a complete absence of mouldings or angles, so as to avoid accumulations of dust. The dining-room is placed behind the administrative block, but unconnected with either it or the patients' blocks, so that to reach it from the other buildings it is necessary to pass into the open air. The other accommodation is all of the most complete description. Special mention must be made of the laundry, in which provision is made for disinfecting soiled linen by superheated steam before it is washed. There is an excellent water supply, and the septic-tank system is employed for the disposal of the sewage. It only remains to add that the site of the sanatorium is 300ft. above sea level, the grounds extend to 85 acres, and they are surrounded in every direction by pine-woods, from which the name of the establishment is derived. So judicious a combination of the resources of science and nature will, it is hoped, achieve great good in the interests of suffering humanity.

The Part Played by Disease in History.

A highly original and interesting view of the function of disease in shaping the history of the world, and particularly of civilisation, is developed in a lecture delivered in Edinburgh University by Dr. S. Archdall Reid. He claims that zymotic diseases have produced evolution of such vast political and biological importance, that the effects of all wars and diplomacy fall into insignificance beside them. Malaria, for example, where it is virulent, acts as an absolute check to colonisation; and the inhabitants of malarial regions must probably be considered to have undergone a gradual and painful process of evolution, in the course of which they paid toll in millions of lives, before they could dwell secure in their fever-haunted fastnesses. But now they cannot be displaced by incoming hordes. Similarly, Dr. Reid points out, our civilisation has been conditioned by our power of resisting certain infectious diseases—a power which has been acquired by a long process of evolution. The races of the New World are suffering extinction in large measure through the introduction of Old-World diseases. With regard to our own Anglo-Saxon race, Dr. Reid shows that they now occupy so large and fertile a portion of the earth's surface, that their world predominance in the future is assured. They may be beaten in war, they may break up into separate governments, but disease could not now exterminate them, and their increasing numbers must give them the ultimate victory. Of the momentous march of disease, which has founded great empires, and for ever changed the political face of the world, historians tell us nothing, while the theme has also been totally neglected by biologists and anthropologists. When the New World was discovered four hundred years ago, a new factor in empire building came into play. Unnoticed by historians, it has given to one vast empire, the Anglo-Saxon—an empire founded by a little people—a stability so great that it will probably endure as long as the human race inhabits the earth. This new light in which to regard history is certainly original, and the application of the method to various climes and peoples, in different periods, may be readily conceived to yield some interesting results.

The Extermination of Rats.

Rats have long been inseparably associated with the plague. Their connection with the outbreak in Glasgow was never conclusively proved, but in India, in Egypt, and latterly in Capetown, they have been, beyond a doubt, largely instrumental in disseminating the disease. Whenever a plague scare arises, one of the first measures proposed is the destruction of rats, but the thing, in a thoroughly complete and effective fashion, is more easily proposed than done. More particularly is it difficult on board ship, and yet it is by means of ships that these insufferable rodents carry the disease germs from port to port. A special interest, therefore, attaches to the recent experiments at the London Docks for the extermination of rats by means of sulphur dioxide gas. This gas seems to have the property of attracting the rats from their holes, and as soon as they breathe the fumes they become suffocated; at the same time it has no injurious effect upon the decorations of the saloon. The experiments were conducted on board the steamship Gourkha, and were highly successful, several hundred rats being destroyed in the space of a few minutes. Among those who witnessed the experiments on the Gourkha was the Chairman of the Cape Chamber of Commerce, and he is said to have been so much impressed with the efficacy of the new method, that he has resolved to recommend its adoption to the Harbour Board at Cape Town, with the view of applying it to all vessels coming from plague-infected parts. We understand that the system has for some time been in operation in America, and the officials of the Board of Health in London are now investigating it with a view to its more general adoption.

MUNICIPAL ENGINEERING & SURVEYING.

CROSS-TABLE CHAT.

The Municipal Engineers' meeting which was held at Chichester on Saturday last was not so well attended as these meetings usually are. This was doubtless due in considerable measure to the fact that Mr. Saunders, the Borough Surveyor, was not enabled to show any new feature or any new work in municipal engineering of general interest. His paper was a record of work well done, which is something more than can be said of most cathedral cities, which are, as a rule, both dreamy and sleepy. The gospel of sanitation was late in being adopted at Chichester, for until 1894 no drainage system existed, and the sewage was turned into soaking cesspools in gravel and chalk, such cesspools not infrequently being directly under the rooms of dwelling-houses with shallow wells for domestic water supply closely adjacent. As a consequence outbreaks of enteric fever were frequent—as any novitiate in sanitation would

expect to be the case. But the proposal to sewer the town provoked bitter opposition, and divided it into two camps—"drainers" and "anti-drainers"—and a lively campaign ensued.

It cannot, however, be said that Chichester folks were much worse than those in scores of other towns, for ignorance and vested interests prevail everywhere, and these factors are always in prominent evidence when measures for improving the sanitary condition and affecting the district rates of a town are projected. Ignorance, however, does not belong, like riches, to a particular class, and an interesting illustration of it was narrated by Mr. Saunders, for, he writes, "in the 'drainage campaign' one of the medical practitioners strongly advocated, in lieu of drainage, a scheme to sink cesspools opposite each house in the centre of the streets, and have the same periodically emptied." That medical practitioner, it appears to us, should be mummified and preserved in a glass case in the local museum as a curio.

The Chichester Corporation cannot be congratulated on the system of sewage disposal which they have adopted, which is costly, inefficient, and dirty, and they would be well advised to discard it as soon as practicable, to the benefit of the district rates. The annual cost of maintenance of the farm, excluding interest and repayment of capital, is £1040 for a population of 10,000, or at the rate of £7 per million gallons of sewage treated, and the purification even at this cost is very incomplete, as the effluent is discharged into the harbour. The Corporation should make themselves acquainted with more modern systems, and a little money spent on a deputation consisting of members of the Sewage Works Committee to see what is being done in regard to treating sewage in other towns would be a good investment for the ratepayers.

But Chichester—notwithstanding its sluggishness in municipal affairs—can give points to another Corporation which is now much in evidence for its antiquated methods of government, viz., Gravesend. This Corporation is one of those effete invertebrate bodies which do not own the gasworks nor the waterworks, and what is more, they do not even appear to possess a sewerage system nor sewage works, although the town has a population of 25,000. The Gravesend Corporation, who have just been pilloried before the Local Government Board for their sins of omission, gravely explained that "Gravesend was just like most other places except that it had cesspools instead of sewers," but the Gravesend cesspool was—according to the estimation of this august body—a paragon of perfection, for it was a perfect septic tank, absolutely out of sight, and, being out of mind, "it was admirable." Moreover, the system of emptying the cesspools by hose pipes and pumping the sewage through the houses to cesspool vans in the public streets was so perfect that there was absolutely no nuisance, and the Gravesend system, the Local Government Board was told, was held in admiration by members of other Councils! One would think so, too, and the system of municipal administration should be a source of admiration also for its antediluvianism. The Gravesend Councillors must be classed as modern Rip Van Winkles, but it is time they awoke, even if it be necessary for the Local Government Board to undertake the task.

Some time ago I drew attention in this column to the growing dissatisfaction to members of local authorities and also to a considerable number of Medical Officers of Health with the results of isolation hospitals, and that instead of such buildings serving to reduce the incidence of infectious disease in districts where they had been introduced, such diseases had prevailed to a greater extent subsequent than prior to their introduction. Since I last wrote—now twelve months ago — the case against infectious hospitals has grown stronger, and the spread of dissatisfaction at the failure of the system has extended greatly, as may be seen from a perusal of the columns of medical journals.

More than this, the ratepayer has just cause to grumble, for the cost of maintenance of such hospitals grows at an alarming rate, and in some districts it has caused an addition to the rates of as much as 8d. in the £. This might possibly be borne without much murmuring if adequate results could be shown, but when it is seen that, coincident with the extravagant cost, infectious disease is not reduced, but has grown more prevalent, "the worm" not unreasonably "turns." It is no use blinking the fact that the system is faulty somewhere, and the sooner this is generally recognised and 'the leek' eaten the better. The time may not yet have arrived when a Royal Commission should be appointed to inquire into the methods of infectious disease isolation as now practised, but I venture to predict that this will be inevitable within the next two or three years, and those who can help it forward will be doing good service.

Reference was made in these notes recently to the annual election of members for the Council of the Municipal and County Engineers' Association. Since my previous notes were written the ballot list has been in the hands of the members and the voting has taken place, with results which will not be declared until the annual meeting in June at Leicester. It is encouraging to observe that more interest has been taken in the election this year than has been the case in the past, and it is evident that members realise that the management of the Association is unsatisfactory, and that the task of removing the inertia must proceed from themselves and not from the Council, who are either unwilling or not desirous of grappling with the problem.

One of the evidences of this increased activity was the circularising of Surveyors to Rural District Councils to record their votes for a rural surveyor whose name was given on the circular, which, however, was not signed by the individual who issued it, and it may, as one member has pointed out to me, have been sent out by the candidate himself—a proceeding which is in violation of the rules of the Association, which prohibit any member canvassing for votes for the office of member of the Council.

But one fails to see the *raison d'être* of the complaint. Sectional representation has nothing to recommend it, and while rural surveyors are justly entitled to vote for whom they choose, is there any specific ground of complaint that their interests have been overlooked? I have taken the trouble to make inquiries into the matter in different quarters, and can find no evidence to support this. Nor can it be justly said that rural surveyors, as a class, are disparaged. Only those, I am assured, advance such a statement whose personal idiosyncrasies have led their fellows to value them possibly in a different light from that seen by themselves.

It is singular that rural surveyors should have adopted such a naïve way of endeavouring to secure the election of one of their number. I venture to think that if they sent in the name of a candidate to the secretary of the Association before April 20th, as any member is empowered to do by the rules of the Association, such name would have appeared on the list. Why this was not done seems inexplicable. I am confident that by following the usual course their laudable desire would have been better recognised than by proceeding in the irregular manner which has been adopted.

Senex.

CORRESPONDENCE.

(*To the Editor of* The Sanitary Record.)

(*We do not in any way hold ourselves responsible for opinions expressed by our correspondents.*)

SUCCESSFUL SEWAGE TREATMENT.

Sir,—On page 338 of your valuable journal of issue of April 18th appears an extract from the report of Dr. George Bury Wray (not Bray, as printed), Medical Officer of Health to the Basford Rural District Council, on the successful treatment of sewage at Kimberley, near Nottingham. As I personally superintended the conversion of these works to that of the Cosham system, I have perused the article with more than ordinary interest. Having acted as clerk of works over many sewage works, ten of which have been on the Cosham system, I find that where chemicals are used much better results are obtained by this system than others, and that with one-sixth part of the chemical recommended by the manufacturers. This in itself is a great consideration; but according to Dr. Wray, the tanks have been working for upwards of a year without the use of chemicals. There are two things that we may learn from this report. (1) That it is unnecessary to incur the expense of covering tanks with arches to exclude the air and light, as the same results seem to be obtainable with open tanks; (2) that we may estimate with some amount of certainty the quantity of sludge we have to deal with in the bacterial system.

On referring to an old note-book, I find that the sizes of the tanks referred to (six in number) are, No. 1 tank, 30ft. by 30ft. by 7ft. deep; No. 5 tank, 30ft. by 15ft. by 7ft. deep from floor to overflow, the capacity of the two being 350 cubic yards. This is the quantity of sludge the Doctor assures us accumulated in the first two tanks in the space of eleven months. The sewage consists of the waste water from two large breweries, several slaughter-houses, mineral water manufactories, and from about 5000 inhabitants; the sewage often comes down to the outfall very hot indeed, with a fair amount of spent hops, the tank capacity being only about seven to eight days' dry-weather flow, according to the capacity defined on the bacterial lines; their work is heavily handicapped. It would be interesting to know whether there are any more Authorities who have adopted this class of tank for the treatment of sewage by the bacterial principle, and if so, with what results.—Yours faithfully, W. Cowper.

Thame, Oxon, June 3rd.

FACTORY *v.* HOME-MADE CLOTHING.

Sir,—I was much struck with the force of Mr. Robinson's letter on this subject in last week's issue of The Sanitary Record, and would like to add that some of the large tailoring factories, or "workshops," as they are known in the Factory Acts, are almost, if not quite, as bad as anything to be found in domestic workrooms.

I have in mind one large tailoring factory, or "workshop," in a city in the North run up by a jerry builder on part of a disused burial ground, which was prepared—when I was a youth—for building on, by having some of the corpses removed so that the wall footings might be put in; the remaining corpses being left undisturbed. The soil-pipe from a series of water-closets passed through the kitchen within a foot of the washing-up sink; indeed, food, and plates, and dishes were frequently piled against it. Of course, there was oftentimes a bad smell—it was almost a permanent condition in the kitchen. There was no ventilation, and in the season I have frequently known the various workrooms overcrowded to an extent of over 70 per cent. I won't attempt to describe the elementary efforts made by the over-worked staff to give the place an appearance of cleanliness; it will be sufficiently understood when I say that the first thing I did on going home after visiting this place was to strip and take a bath and then walk carefully into an adjoining room and put on another complete suit of under and over clothing, leaving that which I had left off to be washed with a disinfectant.

The appearance of vermin upon the goods manufactured in this place was of such frequency that it called forth no surprise whatever—it was either shaken off or whisked off, accompanied by a remark referring to the "Norfolk Howards" or the "Scots Greys."

Don't imagine I have drawn an exaggerated picture of the only place of its kind, for there are many others more or less like it. Their cleanness and sanitary character are oftenest only skin deep. Don't think, either, that I have selected a place belonging to "Jew sweaters," as I have not. The owners are a well-known firm of highly respectable traders, who do only a retail trade, and so far as I know, they are no worse than a great many others.

My knowledge of the conditions under which clothing is made have led me never to buy garments from any maker except I knew who he employed and the manner in which the work was executed, and to steadily refuse all inducements to purchase so-called "cheap" things.

Even if the factory or workshop were sanitarily perfect, it must be remembered that the workers are mostly drawn from the very poor, badly trained, almost uneducated portion of the community, and their condition and that of the homes they live in reduce considerably the chances of purchasers obtaining clean, vermin-free, and disease-free clothing.—Yours faithfully,

Manchester, June 1st. M. Finlay.

"SCHOOL SLATES AND DIPHTHERIA."

Sir,—With reference to a note under the above heading in your journal of May 30th, 1901. In 1896 I published in the *Lancet* a note on "The Slate and Slate Pencil as a Means of Transmission of the Infective Material of Diphtheria and other Diseases amongst School Children." At that time I was investigating a serious outbreak and epidemic of diphtheria in the borough of Maidstone.

I then advised the School and Sanitary Authorities to insist upon the placing of all slates and slate pencils in the several school coppers or boilers, which contained a solution of sodium carbonate (common washing soda) in water, and boiling them for half an hour and then allowing them to drain and dry spontaneously. This, together with the boiling of the school dusters, was systematically adopted. A duster was wrung out in a suitable non-poisonous disinfectant (such as a solution of the bisulphite of lime in water), and was used to erase the writing on the slates during school hours, and the desks and forms were also washed with a similar disinfectant.

The risk of the transmission of infectious diseases by means of the slate is thus reduced to a minimum, and personally my experience inclines me to believe that a piece of slate (unframed) together with a slate pencil, are the cheapest and the most suitable materials for the use of school children, whilst the objections to the use of paper and lead pencils are many, and, even when burning after use is adopted, most difficult to carry out.

Lead pencils are often placed by the children in their mouths and passed from one to another, both within the school and outside. All paper must be carefully and systematically collected and burnt, and not carried out of the school by the scholars. Prevent this. Its retention in the form (of permanent records of the work done by the pupils) as copy-books is open to many difficulties f infectious disease break out in school, as

the disinfection of books and papers, &c., in steam steriliser is both inconvenient and expensive.

My experience of the disinfection of both books and paper (both at home and in India) is that apart from the great non-conductivity to heat of paper, the inconvenience and delay caused to the school during the disinfection, and the subsequent requests for compensation if the least injury is done to the glue and the covers, &c., of school books and the several other articles which must be disinfected when infectious disease arises in a school, is such as to disencourage its extension to exercise books or writing paper.

On a small scale it may be practicable, but on a larger scale I much prefer the slate and slate pencil, which can be dealt with satisfactorily every day if necessary, and checked too.—Yours faithfully,

P. Targett Adams,
The Medical Dept. of the G.P.O.,
2, Fitchett's-court, Noble-street, E.C.

Public Works.

SEWERAGE.

A proposed sewerage scheme for Haworth is estimated to necessitate a loan of £20,000.

At a recent meeting of the Blaby Board of Guardians the Clerk was authorised to make application to the Public Works Loan Board for a further loan of £1411 for sewerage works.

The Mutford District Council has decided to apply to the Local Government Board for sanction to a further loan of £750 for the purpose of completing the Kessingland drainage scheme, making a total of £3850.

The Nuneaton and Chilvers Coton Urban District Council has given the orders for "Meldrum Simplex" Destructor to be erected at its sewage works to supply all power for pumping, &c. A similar plant has been working at Hereford sewage works for four years, resulting in a saving of £400 to £500 per annum.

Last Thursday afternoon there was a large gathering present at the invitation of the Portslade and Southwick Outfall Sewerage Board, to witness the formal opening of the outfall sewer for the drainage of the district. The Chairman (Mr. W. Mews) made a few interesting introductory remarks on the object of the gathering. In a few years, he said, it would be almost past belief that two parishes such as Portslade and Southwick, with a population of some 9000, should have been without any means of disposing of their sewage save by evil-smelling ditches and cesspools. The carrying out of the drainage scheme, he said, had been a matter of eight or nine years' work, during which time they had had many difficulties to contend with. Enumerating these, he mentioned that the Shoreham Harbour Trustees had declined to allow any drainage whatever to enter either arm of the harbour. Then the Board of Trade had raised objections to plans on the ground that the navigation would be interfered with. Their friends at Southwick, too, and also the Authorities at Brighton and Hove, were zealous that no sewage should find its way on the beach. The contract for the present work was entered into two years ago. The land portion of the work had been completed in 1899, and the whole of the time since had been taken up by getting the syphon and the outfall out to sea. He went on to speak of the efficiency of the syphon and outfall, and then gave a word of praise to the clerk of the works (Mr. Hockley) for the admirable manner in which he had carried out his work.

The Christchurch Town Council proposes to drain the borough at a cost of £22,000.

The Wetherby District Council has appointed Mr. E. J. Silcock, M. Inst. C.E., of Leeds, to advise it with reference to a joint drainage scheme for Bramham, Clifford, and Thorparch.

A Local Government Board inquiry has been held at Barrow-on-Soar with respect to an application of the Rural District Council to borrow £9250, the estimated cost of sewerage and a sewage disposal scheme.

At a recent meeting of the Barry District Council it was decided to call the attention of the Sanitary Committee of the Glamorgan County Council to the want of a proper system of drainage at Dinas Powis. It was stated that there was a grave suspicion that the water supply of Barry was being adversely affected.

A Local Government Board inquiry has been held by Mr. Tullock, with reference to the application of the Milton Rural District Council for sanction to borrow £800 for works of sewerage and sewage disposal at Newington. It is proposed to install the septic tank process of sewage disposal in the parish in order to deal with the sewage question.

On the Army Estimates, Vote 10, for works and buildings, a discussion of much interest recently took place on the expenditure incurred on sanitary work in connection with Aldershot and Salisbury Plain. The sewage farm at Aldershot, it appeared in the course of the debate, only accounted for an additional £1500 of the expenditure, and this was due to the increase in the size of the farm caused by the greater number of troops. Salisbury Plain, with the new barracks erected near Ludgershall, absorbed most of the additional money. The site of the new barracks was described as insanitary, and with a very defective water supply. Mr. C. Hobhouse dwelt on these points as likely to be injurious to the county of Wilts, which had taken great interest in sanitary work. Lord Stanley, in reply, assured the Committee that the sanitary needs of the new buildings and camps would be carefully considered, and the vote was carried by a majority of 67.

A letter from the Local Government Board was read at a recent meeting of the Tendring District Council in reply to the Council's application for sanction to borrow £2500 for the purpose of a scheme of sewerage for the parish of Thorpe, stating that it appeared from the plan that the effluent from the filters was proposed to be discharged directly into the ditch, and no provision was made for the laying out of any part of the land as an irrigation area. It would be contrary to their practice to entertain a scheme of sewage disposal of this character unless satisfactory provision was made for the purification of the effluent on a suitable area of land. The plans were returned for reconsideration in this respect. Mr. Golds observed that it was usual to allow one acre for every 200 population. Regard would also have to be made to the mixture of the subsoil. The subsoil in this case was London clay, and therefore not suitable for irrigation purposes. The matter was referred to the Surveyor to report upon it at the next meeting.

WATER.

At a recent meeting of Berwick Town Council, sitting as the Sanitary Authority, it was agreed to adopt a scheme proposed by the Water Committee, whereby water consumed for other than domestic purposes will be charged for either by meter or by agreement. The basis of the charge is to be 1s. per 1000 gallons, subject to a deduction for quantities exceeding 100,000 gallons yearly. It was estimated that the scheme would effect a saving of 2d. per £1 on the rates.

At a meeting of the Castle Douglas Town Council, a report by Mr. R. F. Miller, engineer, Glasgow, regarding a new water scheme, costing £930, was adopted. The money is to be borrowed, the re-payments extending over thirty years.

The Heywood and Middleton Water Board Bill came before Lord Morley's Committee of the House of Lords recently as an unopposed measure. The promoters seek authority to spend £175,000 on increasing the capacity of the waterworks. The Bill was ordered to be reported for the third reading.

At a meeting of the Water Committee of the Crieff Town Council the estimates for the cutting of the pipe track and the laying of the pipes were submitted. The successful offerer was Mr. John Pollok, contractor, Glasgow, the sum being about £1150. It is understood that the contractor will commence operations before the end of the month.

At a meeting of Sculcoates Rural District Council last week, Colonel Wellsted reported that 3000 yards of mains would be required to connect the water supply of Hull with Preston, and with a 5in. pipe that would cost £1500. Mr. Bancroft, Corporation Waterworks Engineer, suggested that an 8in. pipe should be laid. If this were done the Preston people would have to pay a difference of 5s. a yard. The cost of this scheme, and that of connecting Salt End-lane with Preston, will be reported to a future meeting of the Council.

A special meeting of the Brynmawr District Council was held recently for the purpose of further considering the proposed water scheme. The plans for the improvement of the water supply at a cost not exceeding £8000 were approved. The scheme provides for a new system of distribution mains, and the placing of service pipes in all houses; the capacity of the filters will be doubled, and with the balance left after the above works have been carried out, it is proposed to increase the capacity of the reservoir from 8½ to 16 millions of gallons.

A special meeting of the Aberdeen Town Council was held last week for the purpose of considering a report from the Water Committee. This Committee reported that it had considered the question of the appointment of an engineer in connection with the city water supply, and unanimously recommended that the services of Mr. Charles Hawksley, M. Inst. C.E., Westminster, should be engaged, with the view of obtaining a report as to the best source for a new or additional water supply, with an estimate of the cost. The charge for Mr. Hawksley's inspection, survey, and report was stated to be twelve guineas a day. This report was adopted.

The Board of Trade has granted a Provisional Order to the Dearne Valley Waterworks Company authorising them to raise £23,000 additional ordinary capital. Of this sum £3000 is to be issued "to the holders of the existing share capital 'A,' rateably according to their respective holdings in respect of profits which have been expended upon extensions and improvements of the undertaking." The remaining £20,000 is to be raised by shares of £10 nominal value, which are offered for sale by auction or tender. The dividend payable on this new capital is limited to 6 per cent., except as to the £3000 above mentioned, upon which the order places a maximum dividend of 5 per cent. In the event of the profits being insufficient to pay the full amounts of the prescribed rates of dividend, a proportionate reduction "shall be made in the dividends payable on each class." Upon this additional capital the company are empowered to create debenture stock to the extent of £4750. Clause 22 enacts that as from the 1st of April, 1903, the water supplied by the company shall be constantly laid on under pressure. This order will require confirmation by Parliament.

At a recent meeting of the Merthyr Waterworks Committee it was recommended that £65 be paid Messrs. Holmes and King, contractors, on account of the repairs of the Lower Neuadd reservoir; also £288 to the same firm on account of the constructional work at the Upper Neuadd reservoir. It is proposed to stock the reservoirs with fish.

The prospect of the Barrow Water Bill being carried through Parliament is giving considerable satisfaction to a good many of the inhabitants of the neighbourhood of the proposed waterworks. In Ulpha, Seathwaite, Dunnerdale, and the higher parts of the Duddon Valley generally, it is expected that the spending of so much money by the Corporation of Barrow will prove to be a very great boon to the district. There is some reason to believe that this big water scheme may help on the agitation for a narrow-gauge railway in the district.

At the last monthly meeting of the Cirencester Urban District Council, the report of the Water Committee detailing repairs and extensions necessary at the waterworks, involving an expenditure estimated at £3000, the consideration of which was postponed from the last meeting, was brought up, and its adoption moved by the Chairman, and seconded by Mr. F. Cripps, both of whom expressed the conviction of the Committee that the works recommended would render the works completely efficient, and by the duplication of the machinery a practically inexhaustible supply would be available, free from all risks of stoppage from breakdowns. The motion, which also included authority to the Committee to seal a contract for the enlarged boring (estimated to cost £349) was, after a short discussion, unanimously agreed to.

There is now some hope, we understand, that the long-deferred question of making provision for an ample supply of water for the Rhymney Valley will become an absolute fact. During the past few weeks machinery has been conveyed on to the site of the works, and nearly fifty workmen's huts have been built there to accommodate the men. We understand that the larger of the three reservoirs will be proceeded with first. This is situated about three-quarters of a mile above the Rhymney Bridge Station, and when completed will dam back a tremendous volume of water, computed to be sufficient for a three months' supply to the whole of the Rhymney Valley. The two smaller reservoirs will be the same distance above this point. The entire works will involve an expenditure of close upon £25,000. It is expected that the one section will be completed within a year, and that the whole will be ready in about two years. Residents of the valley may therefore look forward with some confidence that the droughts experienced in years gone by will soon be at an end.

LIGHTING.

The Walthamstow Urban District Council has resolved to light the town hall, public library, baths, and technical institute by electricity.

The Southwark Electric Lighting Committee is considering the question of the extension of the Newington electric lighting order over the whole area of the borough.

The Rotherham Corporation electricity generating station in Rawmarsh-road has been formally opened by Mr. D. L. Winter, the chairman of the Electric Lighting and Tramways Committee. The new buildings have been erected at a cost of £24,500.

The financial year of the Glasgow Corporation Gas Department ended May 31st, but it will be a month before the Committee meets to definitely fix the price of gas for next year. It is, however, understood that the Committee does not intend to alter the rate which was fixed last year at 2s. 6d. per 1000 cubic feet.

The Greenwich Borough Council has disapproved of a Provisional Order being granted to the City of London Electric Lighting Company, Limited, to supply electric energy for all purposes in the borough.

Considerable progress has been made in the erection of the new lamp standards on the Thames Embankment. When completed, and the electric light switched on, this will be the best lighted thoroughfare in London.

The Enfield District Council has received a letter from the Joint Committee stating that the total cost of the East Middlesex Electricity Bill was £1205 17s. 8d. Enfield's share was £241 3s. 6d. The Finance Committee's recommendation for payment was adopted.

Mr. H. P. Boulnois, M. Inst. C.E., held a Local Government Board inquiry at Liverpool last week. The subject matters are the applications by the City Council for sanction to borrow £300,000 for the purposes of electric lighting, and £24,000 for the provision of public baths.

At an extraordinary meeting of the Charing Cross and Strand Electricity Supply Corporation, Limited, the chairman presiding, a resolution was passed authorising the directors to raise or borrow such sums as were necessary, to the maximum of £500,000, for the purposes of the corporation's City undertaking.

The Electricity Committee of the Manchester Corporation last week had before the members the tenders for boilers, engines, and electrical work for the Stuart-street Station. The tender for boilers was given to Messrs. Babcock and Wilcox, and the tender for the remainder of the plant went to the Electrical Company, London.

Reigate Parish Church has led the way in the district in the matter of electric lighting. Gas lighting is said to be unsatisfactory for churches, but one cannot help feeling that the adoption of the incandescent mantles would greatly improve the dim, religious glow, which, however effective in an old and time-mellowed building, does not compensate for the struggle to read.

The Leamington Corporation intends to promote a Bill shortly to enable it to withdraw from the purchase of the local gasworks, which it has pledged itself to buy. This can only be done by private Act of Parliament. It is one of the first matters to which the newly-appointed Town Clerk of the borough will have to direct his attention. Since deciding to purchase, the Corporation has realised through the outcry of the ratepayers that it would be much more advantageous not to municipalise the gas; hence it is going back upon its resolution.

The Southwark Borough Council has decided that the Board of Trade be informed that the Council intends to actively oppose the granting of a provisional order to the City of London Electric Lighting Company to empower the company to supply electrical energy for all purposes throughout the whole area of the borough; that the Committee be authorised to obtain the opinion of counsel with regard to the powers of the Corporation to supply electrical energy in parts of the borough other than Newington for street lighting and other municipal undertakings.

At the last meeting of the Deptford Borough Council the Electrical Committee reported that it had considered a letter from the City of London Electric Lighting Company, Limited, giving formal notice of their intention to apply to the Board of Trade for a Provisional Order to empower them to supply electric energy for all purposes throughout the whole area of the metropolitan borough of Deptford. The Committee recommended that the City of London Electric Lighting Company be informed that in the event of their proceeding with the proposed application the Council would oppose it. The recommendation was agreed to.

GENERAL.

The Market Harborough Urban District Council is about to erect a new cattle market and slaughter-houses.

The Manchester Corporation has decided to spend £21,000 in constructing underground conveniences in various parts of the city.

The memorial stone of an extension of the Marine Promenade at Aberystwith was laid last week by the Mayor (Mr. Edward Price Wynne). The extension will cost £13,000, and will be a substantial affair.

A Local Government Board inquiry was held at the Public Offices, Egremont, Cheshire, on Monday last, with reference to the application of the Wallasey Urban District Council to borrow £15,500 for purposes of hospital extensions.

The Wandsworth Borough Council, at the recommendation of the Public Health Committee, has unanimously decided to engage two women for one day a week to assist the Inspector under the Sale of Food and Drugs Act in procuring samples for analysis.

The Mayor of Richmond, Surrey, laid the foundation stone of the new infirmary and nurses' home at Richmond, on Wednesday in last week, which is to be erected by the local guardians at a cost of £40,000. A special feature will be the open-air treatment of consumption.

Plans are being prepared, and will shortly be submitted to the London County Council, for the erection of homes for the working classes in the Limehouse district. We understand it is intended to provide accommodation for over a hundred persons, and the estimated cost is £6000.

Colonel J. T. Marsh, R.E., an Inspector of the Local Government Board, recently held an inquiry at the Council Chamber relative to an application by the Southampton Town Council for permission to borrow the sum of £930 for purposes of street improvement, and £152 for the purposes of public baths.

In view of the possibility of the introduction of plague into Scotland, the Local Government Board, with the object of assisting in the identification of that disease in suspicious cases on board ship, or in the earliest suspected case or cases newly developing in any district, has arranged for bacteriological testing, without cost to the Local Authority, of material from such cases. This material can be received only from the Medical Officer of Health.

Dr. Bulstrode, of the Local Government Board, has been staying some days in Falmouth conferring with the Port Sanitary Authority as to precautions against the introduction of plague, and generally as to the sanitary inspection of vessels. The experience gained by the Board, from inquiries at ports where outbreaks of imported sickness has occurred, seems to point to rats as the most common medium of such importation, and special steps are accordingly being taken to stop the immigration of foreign rats.

Edinburgh Town Council recommitted to the Public Health Committee last week the question of the arrangements to be made for the bacteriological diagnosis of disease. The proceedings of the Public Health Committee are veiled in obscurity, and they are not as explicit as might be wished in setting forth, for the benefit of the Council and the ratepayers, the considerations that induced it to make the recommendation which it addressed to the Town Council. The effect of that recommendation is that the Council should decline all offers of extraneous assistance in this respect, on the ground that the responsibility lying on the Corporation with regard to the public health of the city can only be met by having a complete bacteriological laboratory in connection with the new City Hospital.

A Local Government Board inquiry has been held at Ryde into the application of the Town Council for sanction to borrow £600 for the purchase of horses, harness, and dust carts for scavenging purposes.

The London County Council has convened for Friday, the 28th inst, at Spring-gardens, a conference between its own representatives and delegates from the Metropolitan Borough Councils on the subject of the improved housing of the working classes.

At a recent meeting of Edinburgh Town Council, it was stated that the Medical Officer of Health reported the cost of the preventive measures in connection with the small-pox scare at £3207. Sir Henry Littlejohn suggested that Edinburgh Town Council should promote a Bill to provide for re-vaccination periodically. That was an important suggestion which he suggested should be remitted to the Health Committee. The suggestion was adopted.

We are informed that the East Ham electric tram system, which is owned by the Local District Council, is now practically completed, and that the trams would be running in the course of a few days. The system runs from Manor Park to North Woolwich, through East Ham and Becton, and will join with the Ilford Council's system at one end and the West Ham Corporation's system at the other. When the joint schemes are completed there will be a network of tramways more than thirty miles in extent over these three great "sleeping grounds" of London.

The Corporation of Taunton has led the way in so many municipal enterprises that a refuse destructor might be expected to be already installed in the town. The first step towards the erection of what is considered an essential to the proper equipment of a public health department has now been taken, and the Local Government Board has been asked to sanction the expenditure of £4500 upon a destructor to be erected at the sewage works. Taunton was the first municipality in England to establish electric lighting works, and at the present time extensive alterations are going on at the sewage works to adapt the mode of treatment to the septic tank method.

Mr. Cowan, one of the Local Government Inspectors, held an inquiry in Dalkey last week respecting an application by the District Council for two loans of £2800 and £2200 for the concreting and rekerbing of footpaths and the erection of working-class lodging-houses. Evidence was given that the Council had a borrowing power of £21,000; that the proposed houses were badly wanted, as many of the poorer inhabitants were living in most wretched dwellings, and that they would be let at 3s. 6d. a week. One member of the Council would tolerate the houses, but objected to improving the footpaths, as a "ridiculous and nonsensical scheme," while another took exactly the opposite view, and objected to the houses, but would concede the footpaths. The inquiry then closed.

Last week a conference of the committee appointed from the burghs of Alyth, Blairgowrie, Coupar Angus, and Rattray to consider and report as to the probable cost of a joint infectious diseases hospital for these burghs, and a suitable site, was held in the office of Mr. J. B. Miller, Town Clerk, Blairgowrie. All the burghs were represented, and Provost Templeman, Blairgowrie, presided. It was agreed to recommend to the various Councils that a site of 2½ acres or thereby, on ground belonging to Mr. James Stewart, to the eastward of Old Rattray, and adjoining the public highway leading to Alyth, should be procured, the annual feu-duty to be £10 per acre, no compensation or duplicand being payable. Several of the other proposed sites precluded, by their situation, gas lighting being attainable, and in some of them the expense of getting rid of the sewage would be considerable.

The Annual Congress of the Sanitary Inspectors' Association of Scotland will be held at the Burgh Court Hall, Glasgow, on June 28th. Councillors James Dick and Battersby are to attend as representing the Glasgow Health Committee, and the Corporation is to entertain the members to luncheon.

PERSONAL.

Mr. F. O. Combridge has been appointed Clerk of Works to the Chelmsford Town Council.

Mr. C. W. Thompson has been appointed Inspector of Nuisances for Ridley, at a salary of £60.

Mr. G. F. Dickson has been appointed Medical Officer of the Potton district of Biggleswade.

Dr. F. Edmunds has been appointed Medical Officer to the Chesterfield School Board, at an annual salary of £40.

The salary of Dr. Williamson, Sanitary Inspector of Edinburgh, has been increased from £400 to £500 per annum.

Dr. Sparks has been appointed Medical Officer for the urban district of Whitley, in room of Dr. Alexander, deceased.

Mr. J. H. Sagar, Assistant Borough Surveyor, Stoke-on-Trent, has been appointed Assistant Surveyor to the Poplar Borough Council.

Mr. G. C. Bull, of Turvey, has been appointed Medical Officer for No. 9 district of Newport Pagnell, in succession to Dr. Cock, resigned.

Mr. F. Wilson, of Hampstead, has been appointed Assistant Inspector of Nuisances for Enfield at a salary of £100 per annum, rising to £130.

We hear that the prosperous business of Messrs. Ham, Baker, and Co., of Grosvenor-street, Westminster, has been converted into a limited liability company.

The Local Government Board has sanctioned the appointment of Dr. Tuxford and Mr. Stephenson as Medical Officer and Sanitary Inspector respectively for Boston.

Mr. Amos D. Shrives, Sanitary Inspector, Farnborough, has been appointed Sanitary Inspector to the Guildford Rural District Council at a salary of £150 per annum.

Mr. W. Trevor, Dewsbury, chief assistant-engineer, City of Gloucester Electricity Works, has been appointed Resident Electrical Engineer for the borough of Sutton Coldfield.

Mr. Stilwell has resigned his position as Surveyor for the Rural District Council of Rochford, and Mr. J. Sidwell, of the Blean Rural District Council, has been appointed in his stead.

Mr. John L. Kirkup, Assoc. San. Inst., for 3½ years road foreman for Aldershot District Council, has been appointed to a similar position by the Felling District Council. Mr. Kirkup is well known in Wingate and Lanchester district. He received a timepiece and spirit level from the men at Aldershot on his departure. The District Council also gave him a testimonial.

A difficulty has arisen in connection with the appointment of Dr. A. Underhill as Medical Officer at West Bromwich Workhouse, which was made at the last meeting of the Board of Guardians. Dr. Underhill is at present Medical Officer for Tipton, and the regulations of the Local Government Board, it is said, forbid the appointment of a Medical Officer in a parish when he already holds a similar position in another district. Under the circumstances the Department have intimated that the West Bromwich appointment will not be sanctioned unless there are very strong grounds for doing so.

FORTHCOMING MEETINGS.

JUNE.

Saturday 8th.—Sanitary Institute—Lecture to Sanitary Officers at Yorkshire College, Leeds; Dr. W. Lovell Hunter on "Scavenging and Refuse Disposal; Smoke Abatement." 3 p.m.

Saturday 8th.—British Institute of Certified Carpenters—Visit to Kew Gardens. 3 p.m.

Saturday 8th.—Northern Architectural Association—Visit to Hexham.

Friday 14th.—Institution of Electrical Engineers—Conversazione at the Natural History Museum, Cromwell-road. 9—12 p.m.

Saturday 15th.—The Sanitary Institute—Lecture to School Teachers, Parkes Museum. 10 a.m.

Saturday 15th.—The Sanitary Institute.—Lecture to Sanitary Officers, at Yorkshire College, Leeds, at 3 p.m. "Drainage; Inspection of Builders' Work and Domestic Sanitary Appliances," by W. Spinks, Assoc. M. Inst. C.E.

Wednesday 19th and Thursday 20th.—Institution of Civil Engineers—Conversazione at the Institute, Great George-street, Westminster. 9 p.m.

Saturday 22nd.—The Sanitary Institute—Lecture to Sanitary Officers, at Yorkshire College, Leeds, at 3 p.m. "Sanitary Inspectors' Work (General and Recapitulatory)," by J. R. Kaye, M.B.

Friday 28th and Saturday 29th.—The Sanitary Institute—Examination in Practical Sanitary Science, Practical Hygiene for Teachers, and for Inspectors of Nuisances, Bradford.

NOTES AND QUERIES.

Subscribers may obtain advice on matters appertaining to Public Health Law and Municipal and Sanitary Engineering. Letters should be addressed "Notes and Queries," The Sanitary Record, 5, Fetter-lane, London, E.C. If an answer be required immediately, a stamped addressed envelope must be enclosed

2219.—Combined Drain or Sewer.—"Surveyor" writes:—"A drain which receives the drainage from two houses in my district is constructed with common pipes, and is stopped up. The owner refuses to repair, stating that it is a sewer. The two houses belong to one owner, but there is only one gully, which is in a yard common to both houses."

Answer.—The drain referred to is a private drain, belonging to and vested in the owner, and the Local Authority should serve notice upon him under Sec. 23 of the Act of 1875 to provide a sufficient drain or drains, to be of such materials and size, and to be laid at such level and with such fall as, on the report of their surveyor, may appear to them to be necessary.

2220.—"Sanitas Sanitatum Omnia Sanitas."—"H. J." writes:—"I should be glad if anyone can inform me where the following phrase was used by the late Lord Beaconsfield, viz., '*Sanitas Sanitatum omnia Sanitas.*' I believe it was in one of his speeches."

Answer.—We have no doubt some of our readers can furnish the particulars asked for, and invite their replies for our next issue.

2221.—Examinations in Practical Sanitary Science and for Surveyors.—"Gwalia" writes:—"I have just received the certificate of the Sanitary Institute for Inspector of Nuisances, and am an acting Inspector in a wide rural district. I would like to continue my studies, and ask for your advice as to what would be the most suitable examination to go in for next?"

Answer.—We advise the querist to study for the examination held by the Sanitary Institute in Practical Sanitary Science, which goes beyond the scope of the Inspector's examination, as far as relates to practical sanitation, and a more thorough knowledge of the latter is required in candidates for the examination. On passing the examination successful candidates are entitled to the privileges of members of the Institute, and to the use of the letters "Mem. San. Inst." Having passed this examination, the querist may, if he still desires to pursue his studies, prepare for the examination held by the Incorporated Association of Municipal and County Engineers, particulars as to which may be obtained from the Secretary, Mr. Thomas Cole, 11, Victoria-street, Westminster, S.W.

2222.—Pan Closets: Improper Soil-pipe Ventilators.—"A. S. I." writes:—"I should be glad if you would advise whether my Council can compel an owner of a certain house in which there is a pan closet, the tenants of which house say they have not noticed any smell from such closet, to substitute a wash-down or other sanitary closet. Also, can they compel a person to carry a soil-pipe ventilator above the eaves of the roof full bore 4in., as there are many ventilating pipes in my district which are ventilated by a pipe of smaller diameter above the w.c. junction?"

Answer.—As regards existing houses, the Sanitary Authority would have to prove the existence of a nuisance or the insufficiency of the existing arrangement, before they could in each of the cases named require the removal of the apparatus referred to.

2223.—Dwelling-house in such a State as to be a Nuisance.—"T. W." writes:—"In the case of a private house, or of an unregistered lodging-house, which is in a dirty condition, can the owner be compelled, under Secs. 91 to 94 of the Act of 1875, to cleanse the floors and bedclothes in addition to limewashing and cleansing the room?"

Answer.—The owner cannot be required to do any of the things mentioned under the provisions of Secs. 91 to 96 of the Act of 1875. It is only the occupier who is responsible, and notice should be served upon him. In determining upon whom notice should be served to abate a nuisance, the provisions of Sec. 94 of the Act should be closely followed. This section provides that the notice shall be served "on the person by whose act, default, or sufferance, the nuisance arises or continues," provided that, "when the nuisance arises from the want or defective construction of any structural convenience, or where there is no occupier of the premises, notice under this section shall be served on the owner." In the case named by the querist, the occupier is the person "by whose act, default, or sufferance, the nuisance arises or continues," and he is responsible. There is no structural defect which would render the owner liable. The occupier may be required to do all the things named to abate the nuisance.

2224.—Cleansing Dirty Houses: Upon whom Notice to be Served.—"W. L." writes:—"(1) I am making a house-to-house inspection in my district. In some cases I find the plaster on the walls and ceilings is in a defective condition, having fallen off in patches and scales owing to its impoverished condition, thereby rendering it almost impossible to properly limewash such walls and ceilings. On whom should I serve notice to repair the plaster and afterwards cleanse by limewashing the walls and ceilings? (2) A tenant has been in one house upwards of five years. During that time the walls and ceilings have become dirty. Who ought to be made to cleanse in such a case, the tenant or the landlord?"

Answer.—(1) This is not such a nuisance as can be dealt with under the Public Health Acts, and a notice to repair plaster on walls could not be enforced. (2) The notice should be served on the occupier, as he is the person "by whose act, default, or sufferance the nuisance arises or continues." See Sec. 94 of the Act of 1875.

2225.—Veterinary Charts showing Internal Organisation of the Ox.—"R. H. W." writes:—"I believe there is a book published on the ox, showing in a sort of atlas fashion its internal arrangement; that is, you can lift up a page which represents the side of the animal, and there is exposed the inside. In the same manner the various organs may be lifted up, showing both inside and outside. It is essentially a book for meat inspectors, and I believe is published at about 5s.; but, unfortunately, I do not know the publishers or the author. Can you please advise me on the subject?"

Answer.—The book required is doubtless Professor G. T. Brown's "Anatomical Model of the Ox," showing its external and internal organisation by means of superimposed plates printed in colours, with descriptive text, strongly bound in stiff covers, price 3s. 6d. net. Similar anatomical models are published of "The Horse," by George Fleming, F.R.C.V.S., price 3s. 6d.; "The Sheep," by Professor G. T. Brown, price 3s. 6d.; and also "The Dog" and "The Pig." Any of the books may be obtained post free, at the prices named, from the office of this journal.

2226.—Private Streets Works: Adoption as Highway does not Prevent Recovery of Instalments.—"A. B. C." writes: "Some private streets have been sewered, levelled, paved, and flagged under Sec. 150 of the Public Health Act, 1875, by the Council. The apportionments have been made, and two yearly instalments have already been paid. Six months ago the Council declared these streets public highways in the usual manner. One of the owners of property now declines to pay his apportionment, and states that as we have declared the street a highway we cannot recover. Would you advise whether his contention is correct?"

Answer.—The owner's contention is quite incorrect. The practice of adopting private streets as public highways before the owners have recovered the entire cost of making up the street under Sec. 150 of the Act of 1875, or under the Private Street Works Act, 1892, is general in most districts, and does not in the least

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affect the power of a Local Authority to recover the expenses as private improvement expenses. Proceedings should be taken against the owner under Sec. 257.

2227.—Purveyor of Milk: What Constitutes such?—"Inspector" writes:—"A person holding charge of a refreshment bar at (a teetotal) working men's institute sells glasses of milk over the counter for his own profit. It is pointed out to him by an Assistant Inspector of Nuisances that the law requires him to register himself as a 'purveyor,' and he is supplied with form of application for the purpose. He refuses to register on the ground that he does not come within the law, and that many others in surrounding districts, hotel keepers, inn keepers, coffee-house keepers, and caretakers of similar institutes, are allowed to trade unregistered. I, the Inspector, apply to my Council for leave to summons. The Council's legal adviser cannot certainly say if the man is a 'purveyor' or not, but dissuades the Council from acting on the ground that there is no legal decision as to the man's position, and that the Justices might not convict. The question is adjourned. (1) Am I right in my report that this man is a 'purveyor' of milk within the meaning of the law? (2) Is there any ruling decision in point? (3) Is this man's case on all fours with that of an inn or hotel-keeper supplying glasses of rum and milk or milk and soda, or milk alone to people staying in his house? (4) Or to the general public at the public bar? (5) Or if there are distinctions what are they?"

Answer.—(1 and 2) We doubt whether a person who occasionally sells milk over the counter in such a case as that named can be deemed to be a "person who carries on the trade of a purveyor of milk," and whether he contravenes Section 6 of the Dairies, Cowsheds, and Milkshops Order, 1886. In Southwell *v.* Lewis, 45 J.P., 206, where a farmer who kept cows for the supply of his family and for amusement, and who occasionally allowed his neighbours and a dairyman to have a few quarts of milk, it was held that he was not a cowkeeper or dairyman within the corresponding provision of the repealed Order of 1879. Field, J., said, "if there had been a regular and continuous supply of milk it might have made a difference." Now, in the present case the attendant cannot be said to be carrying on the trade of a purveyor of milk, and there does not appear to be a regular and continuous supply of milk. There is no decision directly affecting this point. (3 and 4) Yes. (5) The conditions are similar.

2228.—Coal-gas: Influence of Temperature and Atmospheric Pressure Thereon.—"X. Y. Z." writes:—"What is the influence of temperature and atmospheric pressure upon the volume of coal-gas? Also what are the effects of temperature in modifying the quantity and quality of gas produced from retort furnaces?

Answer.—The querist is advised to procure Hughes and Richard's "Gasworks, their Construction and Arrangement, and the Manufacture and Distribution of Coal-gas," price 3s. 6d., wherein he will find the subject fully treated upon. The answer is too long for insertion in this column.

2229.—Water Supply Discoloured by Peat: Means of Remedying.—"Aqua Pura" writes:—"On a water-gathering ground in this locality, which is otherwise of an excellent nature, there is a portion of peaty land a few acres in extent, but from 3ft. to 4ft. deep, and gives up undesirable ingredients to the water. It has been suggested that some local means might be adopted to get rid of this peaty matter or counteract its bad influence, apart from the question of digging it all out, which would be too great an undertaking. Have you or any of your readers any knowledge of a means for preventing the said discoloration and acidity which this peaty area gives to the water, apart from excavation or the filtration of the whole supply? Any suggestions would be gladly received."

Answer.—The most effectual remedy is to collect the water from the peaty area separately, and treat it by liming under the supervision of a skilled chemist, so as to secure the proper admixture, for if too much lime be added it increases the solvent action of the water. Or the water may be passed through filter beds composed of an upper layer of sand, or of sand and polarite, and a lower layer of broken limestone. The fine sand intercepts the peaty matter, and greatly improves the palatability and appearance of the water, and the limestone hardens it, so long as it can be kept free from the coating of peaty matter. When this occurs the limestone must be renewed.

2230.—Sewage Scheme: Discharging Effluent into Tidal River.—"Surveyor" writes:—"We propose carrying out a sewerage and sewage disposal scheme. The former will consist largely of alterations to old work. There is no land provided, and none available unless pumping be resorted to. The present outlets are into a tidal river, on which is the harbour. Will the Local Government Board be likely to approve the scheme without passing the effluent over land before discharging into the tidal river?"

Answer.—The querist omits to give us any particulars of the proposed mode of treatment of the sewage preparatory to its discharge into the tidal river. If the query is directed to ascertain whether the Board would sanction a sewerage scheme wherein the sewers are intended to discharge directly into the river, we advise him that the Board would not approve such a scheme. If, on the other hand, it is intended to provide either septic or detritus tanks and bacteria filters, without passing the effluent over land, such a scheme would, we think, meet with the Board's approval.

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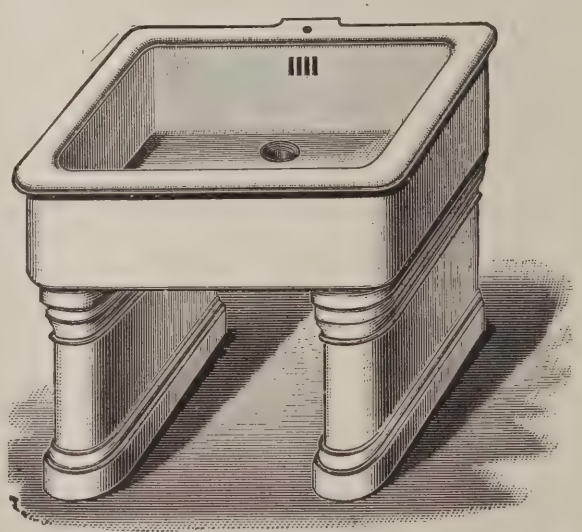

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THE CONSTRUCTION OF ROADS, PATHS, AND SEA DEFENCES.

By Frank Latham, C.E.

(Borough Engineer and Surveyor, Penzance. Author of "The Sanitation of Domestic Buildings," &c.)

(*Continued from page* 488.)

CHAPTER II.—THE NECESSITY OF GOOD ROADS FOR TRACTION.

Sir Isaac Newton, writes Parnell, "has laid it down as a general principle of science, that a body, when once set in motion, will continue to move uniformly forward in a straight line by its momentum, until it be stopped by the action of some external force. This proposition is admitted and adopted by all natural philosophers as being perfectly true, and, therefore, in order to apply it to roads, it is necessary to inquire what kind of external forces act in a manner to diminish and destroy the momentum of carriages passing over them."

Sir Henry Parnell remarks, "As a carriage for conveying goods or passengers when put in action becomes a moving body, in the language of science, the question to be examined and decided is, how a carriage when once propelled can be kept moving onwards with the least possible quantity of labour to horses, or of force of traction."

Each of these great philosophers admits that some more or less controllable influences are constantly at variance with the principle of science known as the "first law of motion," and that the causes thus offering resistance should be ameliorated to as great a degree as possible. In this respect due regard must also be given to the necessary requirements for the comfort and safety of those that produce the propelling force to such traction, as well as keeping the object in view of reducing the force of traction.

Resistance to rolling is principally due to four causes, viz., surface protuberances and irregularities, surface and wheel friction, surface grades, and wind pressure.

Surface protuberances and irregularities.—When a wheel comes in collision with any hard road obstruction, it becomes necessary for a horizontal force to be exerted at the axle, to raise such weight carried by the wheel to a height equal to that of the obstacle to be drawn over. In comparing a road of considerable protuberances and irregularities with one of smooth surface, the comparative loss of energy in drawing a heavy load must be a matter of no little moment. These irregularities are further responsible for resistance caused by the shocks, which are greater when a vehicle is drawn at a high speed than at a low one.

On ordinary hard roads the resistance attributable to the actual raising of the weight over trifling obstructions is, perhaps, less to be taken into account than that responsible for the concussions that take place as the load is drawn over roughly paved surfaces, and in which, as M. Morin determined in his experiments, the resistance to traction is increased with the speed.

In the case of the want of uniformity in the road surface the resistance may readily be arrived at by the application of the following formula:—

Let P = the force required.
W = the weight, for example taken at 300 lb.
R = the radius of wheel ,, 30in.
O = the obstacle ,, ,, 2in.

then $$P = W \frac{\sqrt{R^2 - (R - O)^2}}{R - O}$$

$$\therefore \quad P = 300 \frac{\sqrt{30^2 - (30 - 2)^2}}{30 - 2}$$

Springs to vehicles have a tendency to diminish the resistance offered by road inequalities at high speeds. Mr. Codrington says regarding this: "The effect of springs in reducing draught is that they enable the wheels to rise and fall over inequalities over the road, while the load on them moves forward without being sensibly raised. The more perfect the elasticity of the springs in a vertical direction the greater is the reduction of draught, but any elasticity in the direction of the traction tends to increase the draught."

Surface and wheel friction.—This form of resistance varies according to the material used, whether it be hard or soft; also, to some extent, according to the size of the wheel. On soft roads the wheel will, to some extent, penetrate the surface, so that when in motion it will be obstructed by a force in front of it of either grit, dust, or by the weight of the vehicle causing an indentation sunk in the material itself. This, consequently, has the constant effect of causing the wheel to climb an irregularity equal to the depression so formed. The amount of penetration is less for large wheels than for small, but it is sufficient for general purposes, and for wheels of ordinary sizes, to calculate the resistance thus caused by penetration by the weight multiplied by a ratio to be determined on by the nature of the road surface, whether it be hard, soft, or medium. The following tables are the results of experiments by Sir John Macneil (made with an instrument he invented for the purpose), as to the resistance to traction of various descriptions of roads.

A wagon weighing 21 cwt. was used on different kinds of roads with the following results:—

	lb.
On well-made pavement the draught is.. ..	33
On broken stone surface, or old flint road ..	65
On gravel road	147
On broken stone road, upon rough pavement foundation	46
On broken stone surface, upon a foundation of concrete formed of Parker's cement and gravel	46

The following empirical formulæ is given by Sir John Macneil for calculating the resistance to traction on level roads for (i.) a stage wagon; (ii.) a stage coach:—

P = force required.
W = weight of vehicle in lb.
w = weight of load in lb.
V = Velocity feet per sec.
C = A constant number depending upon the nature of the surface over which the carriage is drawn.

Then $$P = \frac{W + w}{93} + \frac{W}{40} + C V \quad \ldots \quad \ldots \quad \text{(i.)}$$

and $$P = \frac{W + w}{100} + \frac{W}{40} + C V \quad \ldots \quad \ldots \quad \text{(ii.)}$$

The value of C is as follows:—

On timber surface	C = 2
On paved surface	C = 2
On a well-made broken-stone road	C = 5
On a well-made broken-stone road, covered with dust	C = 8
On a well-made broken-stone road, wet and muddy	C = 10
On a gravel or flint road, in a dry, clean state	C = 13
On a gravel or flint road in a wet and muddy state	C = 32

Example:—To find the force necessary to move a stage coach at a velocity of 10ft. per second, the coach weighing 1500 lb. and carrying a load of 700 lb., and the surface of the road being well-made of broken-stone, but wet and muddy.

Then, according to (ii.)

$$\frac{1500 + 700}{100} + \frac{700}{40} + (10 \times 10).$$

Grades.—Surface grades bring into account the additional force of gravity.

The tractive resistance due to the grade is that force

which is necessary to support a wheel on an incline and to prevent it from running down, under the pressure of its load + the effects of friction.

Therefore the total tractive resistance to be arrived at is, the sum of a given load hauled over a level road + the extra force required to draw the same load up to a graded road.

The following diagram (Fig. 1) is to represent a wheel C loaded with a weight W.

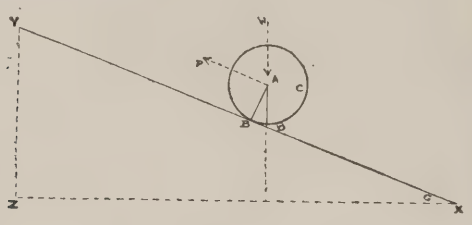

Fig. 1

The wheel is in contact with the inclined plane X Y at B, and P is the force required to haul the load up the incline, and acting parallel to the road.

The wheel is maintained in position by these forces, viz., W, which at all times acts in a vertical direction. By the force P, which is the applied power parallel to the inclined plane, and by the pressure caused by the weight of the vehicle on the road's surface at B, and which is effected by a perpendicular from the point A with the inclined plane X Y.

Draw the vertical base X Z and the horizontal line Y Z, then the relative magnitude of the three forces at P, W and D may be determined.

Because A D and Y Z are parallel and are cut by the line X Y, then the angles A D B and X Y Z are equal, and the angle A B D is equal to the angle X Z Y, being both right angles, therefore the remaining angles B A D and Y X Z are equal, and the triangles X Y Z and A B D are similar.

Now, as the sides of the triangle A B D are proportional to the three forces by which the vehicle is sustained, so also are the three sides of the similar triangle X Y Z, viz.: X Y is proportional to W, Y Z to D, and X Z to the pressure B.

i.e. W : X Y : : D : Y Z,
and W : X Y : : B : X Z.

Therefore if to X Z such a value be allotted that the vertical rise of the road is exactly 1ft., then:—

$$D = \frac{W}{XY} = \frac{W}{\sqrt{AG^2 + 1}} = W. \sin G,$$

$$\text{and } B = \frac{W. X Z}{X Y} = \frac{W. X Z}{\sqrt{X Z^2 + 1}} = W. \cos G.$$

In order to ascertain the force required to move a vehicle upon an inclined road (neglecting the effects of friction), divide the weight of the loaded vehicle by the length of the inclined surface, which affords a rise of 1ft., and the quotient will represent the force required.

Again, in order to ascertain the force with which such vehicle bears upon the surface of the same road, the horizontal length of the road is to be multiplied by the weight of the loaded vehicle and the product divided by the inclined length of same, and the result will be the pressure required.

The pressure of a wheel on an inclined road is slightly less than the actual weight, but the difference is very slight on grades of normal inclination.

To ascertain the resistance to the traction of a vehicle being drawn up or down an incline, first determine the resistance on a level road of such load, the surface to be taken as the same as that of the incline. To this result add or subtract, according to whether the vehicle is travelling up or down hill, the force requisite to sustain the same weight on the incline; then the sum of resistance on a level road and the force requisite on the incline will express the force required for ascending the incline, and the difference of the two results will be the force required for descending the incline.

When the grade force is greater than the surface resistance, it may be necessary to apply extra force to check the propelling force.

Mr. D. K. Clark, in the "Construction of Roads and Streets" (Law and Clark), says: "Rolling or circumferential resistance of wheels is equal to the product of the load by the third of the semichord (of the submerged arc of the wheel), divided by the radius of the wheel." He further remarks: "This question is no doubt applicable, with a sufficient degree of accuracy, for any real needs for calculating the resistance of gravel, loose stones, soft earth or clay." He then deduces as follows: That "the circumferential or rolling resistance of wheels to traction on a level road is inversely proportional to the cube root of the diameter," and that in order "to reduce the rolling resistance of a wheel to one half, for instance, the diameter must be enlarged to eight times the primary diameter." M. Dupuit deduced that on macadamised roads of good condition, and on uniform surfaces, "the resistance to traction is directly proportional to the pressure. It is independent of the width of the tire. It is inversely as the square root of the diameter. It is independent of the speed."

M. Dupuit admits that on paved surfaces which give rise to constant concussion, it increases with the speed.

Mr. Thomas Codrington says: "The resistance due to gravity on inclined roads must, of course, be allowed for in all considerations of draught. It is very nearly equal to the gross load divided by the rate of gradient; thus, on a gradient of 1 in 20 the increase of draught due to gravity will be $\frac{1}{20}$th of the gross weight of the vehicle and its load."

Tractive power.—The tractive power of horses is influenced by still another important condition to those stated, and that is the foothold afforded by the surface. The load drawn by a horse, although not generally affected on the level, must be regulated according to the grade and surface of the greatest incline the load is to be drawn up.

Mr. Macneill, in his "Notes" on the "Holyhead Road," remarks to the following effect:—That when the road is not horizontal, the force of gravity is a great impediment to the draught of carriages, and considerably limits the effect which would otherwise be produced by a horse in drawing a load. If it were not for the hills that are usually met with on turnpike roads, one horse would do as much work as four; for it is well known that the force of draught must be commensurate to the steepness of hills. This being the case, it is important that the greatest facilities should be given to render the ascent as easy as possible by paving such grades with suitable materials that would afford the best foothold.

A horse that is able to move a maximum load on a horizontal road of smooth asphalt is only able to draw about one-fifth of the same weight up an inclination of 3 per cent. paved with similar material; whereas the same horse that draws its maximum load on a level macadamised road is able to draw nearly one-half of the same weight up a 3 per cent. incline paved with similar material. A horse that draws its maximum load on a macadamised road provided with smooth asphalt trackways is able to draw nearly one-third of this weight up an incline of 3 per cent. on a similar surface.

The difference between the maximum load that a horse is able to draw on smooth asphalt, compared with that on a good macadamised surface, is about 50 per cent. in favour of asphalt on the level, and the average foothold that a horse obtains on all grades up to 5 per cent. on good macadam as compared with

smooth asphalt, is about 75 per cent. in favour of the former.

The tractive power of horses varies very considerably, according to the work and description of pavements that they have been accustomed to. It is, therefore, difficult to arrive at anything but an approximate idea on this subject.

The force that a horse may exert may be taken as inversely to the rate at which it travels. An average horse that works ten hours a day at a speed of 250ft. per minute, on a horizontal road, should be able to pull a draught of 75 lb. This would be equivalent to lbs. × feet × time (in minutes).

$\therefore 75 \times 250 \times 600 = 11{,}250{,}000$ foot-pounds,

as representing one day's horse work.

The following will show the tractive force as affected by the amount of resistance offered by the road surface. From experiments made by Sir J. W. Bazalgette: Gross load, four tons; speed from four to six miles per hour:—

	Tractive force on the level.
Macadamised surface	40·7 to 42·29 lb. per ton.
Asphalt	39·0 to 39·32 lb. per ton.
Wood	33·62 to 36·63 lb. per ton.
Granite setts	26·2 to 27·0 lb. per ton.

Comparative statement given by Mr. H. P. Boulnois in his "Municipal and Sanitary Engineers' Hand-book," showing the traction upon level roads formed of different surfaces; asphalt being taken as the standard of excellence:—

Asphalted roadway	1·0 —
Paved roadway, dry and in good order	1·5 to 2 0
" " in fair order	2·0 to 2·5
" " but covered with mud	2·0 to 2·7
Macadamised roadway, dry and in good order	2·5 to 3·0
" " in a wet state	3·3 —
" " in fair order	4·5 —
" " but covered with mud	5·5 —
" " with the stones loose	5·0 to 8·2

(*To be continued.*)

SANITARY LAW (A).*

By Trevor Edwards, Esq., West Riding Solicitor.

THE PUBLIC HEALTH ACT, 1875, AND THE MODEL BYE-LAWS THEREUNDER.

I have to speak to you to-day upon sanitary law, confining myself more particularly to the Public Health Act of 1875. As it is always useful to know what foreigners have to say about us, whether in relation to our laws or our habits, I will read you the following opinion, which I came across a few weeks ago, expressed by a sanitarian of continental reputation, and one who is well versed in all sanitary codes of the civilised world. He says: "Of all countries of the civilised world none has a sanitary code so praiseworthy and complete and so precise as England;" and he proceeds to attribute this to the regard we have for our self-interest thus:—

"The code is the work of the nation which has recognised its necessity in its own interest. In the whole country the marvellous results which have been produced can be seen. Thanks to these laws, the rate of mortality has been lowered—the mean duration of life increased—the amount of sickness decreased. They have greatly alleviated the misery in the houses of the poor, who, thanks to sanitary measures, have a better prospect of recovering their health and the means of providing for their subsistence and that of their families."

You who are conversant with the practical working of our sanitary law are probably more impressed with its shortcomings and at times lament that it does not more fully cover the ground of delinquencies in regard to our communal life. In some support of such views, let me read to you the following extract from an interesting little work by Mr. J. Pollard (published by Wm. Blackwood and Sons, Edinburgh and London), entitled "A Study in Municipal Government." Speaking of the sanitary administration of Berlin, the author says:—

"Every house proprietor is bound, when he finds his tenants keeping their dwellings in a filthy state, to warn them to cleanse them forthwith. If they do not, they are turned out without further ceremony. Should the landlord neglect or fail to perform his duty in this respect, a complaint made by the neighbours—a half-penny post card addressed to the proper quarter—will ensure a visit from an officer of the sanitary department. This officer will, if he finds the house filthy, order out the inhabitants, and cleanse it at the landlord's expense. 'But do you not think you interfere too much with the liberty of the subject?' was the natural question. 'Liberty of the subject, mein Herr!' retorted Stadtrath Meubrink, to whom my best acknowledgments for most courteous attention are due; 'Liberty of the subject! May I ask whether your theory of government is not the greatest happiness of the greatest number?' The reply was in the affirmative. 'And have you not power to remove people from their houses when these become dangerous to the health of their neighbours?' 'We have when infectious disease breaks out among them.' 'Ah, but we anticipate you. We know that this dirt will gender and foster fever. We don't care to wait till fever breaks out. It may come in spite of us, through water or milk or otherwise; but we regard all fevers as preventable diseases, and we feel bound in the interest of the community to prevent them where we can. We too respect the liberty of the subject; but we deny the liberty of the subject to make himself or his home a source of danger to the health and life of his neighbours. We are just a little in advance of you in this matter.'"

There was no rational answer to this retort.

I believe that some such regulations will have to be enacted in England, and perhaps the cleansing of Persons Act, 1897, is but their forerunner.

I do not propose on this occasion to dwell upon the various aspects of law, but only to suggest some few ideas which will serve as an introduction to the systematic and more careful study by you of the law which you have to enforce. The Inspector of Nuisances is a creature of statute, and his duties are expressed by statute. In taking up the study of the Act, and especially its execution, endeavour to imbibe its spirit. Its prevailing note sounds out from the word "nuisance." Some dislike the term "Inspector of Nuisances," and prefer the more modern expression "Sanitary Inspector." I think there is very little to choose between them, and should suggest that you be satisfied with the older and more correct title, "Inspector of Nuisances." The word "nuisance" is derived from the Latin word which means harm, injury, hurt. The spirit of the code, therefore, is to prevent or protect from harm, and happy is the Inspector who can fully grasp the extensive and beneficent purport of the great ideal environing the office of an English Inspector of Nuisances.

I cannot to-day attempt any reference to the decisions of the Law Courts, nor indeed to take up the Act section by section, and explain to you what they teach. As I have already said, I purpose rather to introduce the

* Third Lecture delivered to the Health Officers of the West Riding of Yorkshire April 27th, 1901, at the Philosophical Hall, Leeds.

code. Before doing that will you let me remind you of the fact, never to be forgotten by West Riding men, that it was a Yorkshireman, the late Right Honourable J. Stansfeld, M.P. for Halifax, who did great service in laying the foundations of our sanitary code. He not only gave years of his life towards framing and improving the code, but as the first President of the Local Government Board, he administered his office with the enlightenment which his great knowledge of its duties could alone produce.

If I were an autocrat I might be induced to add to the list of duties of an Inspector of Nuisances prescribed by the Local Government Board, something like this:—"He shall systematically read the Public Health Acts, the local bye-laws, and the duties prescribed by the Local Government Board once at least in every year."

As preparatory to taking up the Public Health Act, I advise you to carefully read the admirable circulars issued by the Local Government Board in 1875-6, explanatory of the Acts.

Too much importance cannot be placed upon the systematic perusal of the Act, for it is impossible for an Inspector of Nuisances to carry out his duties unless he knows that Act well. It is not enough that he should get his ideas from the Medical Officer of Health or from the Clerk to the Sanitary Authority. He should have the text of the Act ever at hand, and it will follow from systematic study, his duties will soon become impressed on his mind. As an Inspector he is an executive officer who can only perform certain acts.

In the study of the law I do not advise you in the first instance to get any commentary or treatise upon it, but confine yourself to the Act itself—preferably a King's Printer's copy. The Acts should be provided by the Local Authority as part of the equipment of the department. Having got your Act, let it be well bound, and interleaved with two plain sheets between each page of the Act, and several at the end for general notes. Upon the interleaved sheets note up from time to time any important interpretation of the text, decisions of the Courts, &c., references to other sections or Acts amending or extending it. In that way you will in course of time have a valuable collection of information which will not only assist you in discharging your duties promptly, but will enable you to instruct your assistants with assurance. To the extent that you show yourself master of your work, to that extent you will draw to yourself the respect and confidence of those serving with you.

What I have said as to the study of the Acts applies with equal force to the local bye-laws of your department, which, as you know, are an extension of the Acts. They fill up many details which the Public Health Act leaves to each locality to settle for itself, subject, of course, to the approval of the Local Government Board.

Having provided yourself with the Act, the next point is to learn how to acquire its meaning to the best advantage. In reading through a section of an Act of Parliament one cannot help but be struck by its great verbiage, and it is not easy at first to grasp its central idea. It is advisable, therefore, to pick out the substantive words and italicise them. Take, for example, Section 116, which I would underline as italicised thus:—

Unsound Meat, &c.

116.—*Any* Medical Officer of Health or *Inspector of Nuisances may* at all reasonable times *inspect and examine* any animal, carcase, *meat*, poultry, game, flesh, fish, fruit, vegetables, corn, bread, flour, or milk exposed for sale, or deposited in any place for the purpose of sale, or of preparation *for sale*, and intended for the food of man, the proof that the same was not exposed or deposited for any such purpose, or was not intended for the food of man, resting with the party charged; *and if* any such animal, carcase, meat, poultry, game, flesh, fish, fruit, vegetables, corn, bread, flour, or milk appears to such Medical Officer or Inspector to be diseased, or unsound, or unwholesome, or *unfit for the food of man*, he may *seize and carry away* the same himself or by an assistant, in order to have the same dealt with by a Justice.

The words in italics read as follows:—Any Inspector of Nuisances may . . . inspect and examine . . . meat . . . for sale . . . and if . . . unfit for food of man . . . seize and carry away. Thus by reading only the words italicised or underlined, you may almost at a glance see what is the real purport and subject of the section. Subsidiary underlinings, connecting details, &c., may also be made, provided that the text is not overweighted. This practice will impress upon your mind the provisions of the Act, and incidentally the course of your duty, and if at any time you are in doubt as to whether you ought to take this course or that in connection with any matter of emergency and have not time to consult the Clerk or Medical Officer of Health, a glance at your underlined text will give you greater confidence in your action. Before commencing the study of the sections, carefully consider what appears to be no part of the Act itself—the arrangement of the sections. This shows you the main outlines of the Act, and should be as clearly understood by the Inspector as a map by a war general.

The Act, you will observe, is divided into parts. Part I. is introductory, and Part II. you need not trouble about. Part III., "Sanitary Provisions" is the main part of the Act which affects you. In Part IV., "Local Government Provisions," the only division that you need trouble about is "Markets and Slaughter-houses." The only other portions of the Act that I need refer to are Part VII., "Legal Proceedings," and the first two sections of Part X.

I direct attention for a short time to Part III., "Sanitary Provisions." You will find that it is generally divided into certain groups of sections which deal with different departments of your work, and these groups are further sub-divided into smaller groups. There is, first of all, a division dealing with sewerage and drainage, and the advantage of this is that if at any time you have need to consult the Act upon any question of drainage, you will seek for the information there. The first sub-division relating to sewers and drains, extending from Section 13 to Section 26 requires particular attention at your hands; but the next sub-division, "Disposal of Sewage," needs attention by the Surveyor or Engineer rather than from you. The division headed "Privies, Water-closets, &c.," which comprises only seven sections, is of the greatest importance to an Inspector of Nuisances.

I shall not take up your time by pursuing this line of tuition any further, for I think I have sufficiently indicated the advantage of learning first the structural outline of the Act before entering upon its detailed study. If you have the outline well impressed on your mind you will know how to find your way about the Public Health Act without loss of time. In entering upon the sections, the first one to claim your notice is the fourth, which deals with "Definitions." It is a section of the greatest importance. Almost every word in the English language can be used in a variety of senses; and it is necessary that you, when preparing your reports, or when you give evidence in a Court — indeed, on all official occasions — should employ your words in the sense which they bear in the Act of Parliament. On this occasion I can only give a brief selection. Take the term "Local Authority." The section states that "Local Authority *means* Urban Sanitary Authority and Rural Sanitary Authority.' First I draw your attention to the signifi-

cance of the word *means*. In reading through this section you will observe that at times the word "*means*" is used, and at other times the word "*includes*." These words are selected for an express purpose. Whenever you find that any expression or word is said to *mean* something you may conclude that the definition is exhaustive; for instance, when it is stated that "Local Authority" means Urban Sanitary Authority and Rural Sanitary Authority, we are to understand that it means an Urban and a Rural Sanitary Authority, and no other body, whether it be Parish Council or County Council. Now, on the other hand, when the word *includes* is used, it signifies that the definition is not exhaustive, but mainly indicative. Take the definition of the word "Surveyor." It *includes* any person appointed by the Authority to perform any of the duties of surveyor under this Act—whether he be an actual surveyor or not.

Returning to our definition of "Local Authority," you will understand, then, that whenever the term is used in any section the reference is to both Urban and Rural Sanitary Authority; so that when Section 24 enacts that "where any house within the district of a *Local Authority* has a drain communicating with any sewer, &c.," we know that it refers to houses in Urban or Rural Sanitary Districts. On the other hand, when Section 20 says, "An Urban Authority may, if they think fit, provide a map, &c.," we know that this power is limited to Urban Authorities, and is not conferred upon Rural Authorities, otherwise the words Local Authority would have been used.

Consider now the definition of the word "Owner." It is necessary that an Inspector of Nuisances, especially when serving a statutory notice, should know upon whom to serve it, and unless he is acquainted with this definition he may be in a difficulty.

"Owner" means "the person for the time being receiving the rack-rent of the lands or premises in connection with which the word is used, whether on his own account or as agent or trustee for any other person, or who would so receive the same if such lands or premises were let at a rack-rent."

If at any time you are in doubt as to who is the owner or what the expression "Owner" means, read carefully this definition, together with the following definition of the word *rack-rent*, and I think your difficulty will evaporate.

I would next call your attention to the definition of "Drain," which runs thus:—"Drain" means any drain of and used for the "drainage of one building only, or premises, within the same curtilage, and made merely for the purpose of communicating therefrom with a cesspool or other like receptacle for drainage, or with a sewer into which the drainage of two or more buildings or premises occupied by different persons is conveyed." This definition has given considerable trouble, and the Law Reports contain scores of cases bearing upon it. The difficulty has arisen in applying it to varying circumstances.

(*To be continued.*)

The annual inspection of the Waterworks at Lintrathen by the members of Dundee Town Council took place last Thursday. Early in the forenoon the party, in number about fifty, entrained at the West Station for Alyth, which was reached after a pleasant journey. Thence they were driven to Lintrathen, where the company divided—one portion driving round the loch, while the other preferred to stroll in the beautiful grounds. Glorious weather favoured the party, and a most enjoyable time was spent. Luncheon was served in a marquee recently erected in the grounds. The special train conveying the Councillors and their friends homeward arrived at Dundee about 9.30 p.m.

THE TRURO SEWERAGE DISPOSAL SCHEME.

Although comparatively a small matter in itself, the above scheme has assumed a certain amount of importance to municipal engineers, as it has been made the occasion for a direct attack upon modern methods of sewage treatment. We have ever entertained the belief that the best way for getting at the truth of any matter is to let all sides have a hearing. In fact, it is only by fairly facing the objections to, and weak points of, any system that perfection will ever be attained. Honest criticism should always be welcomed, but if it is advanced merely for selfish purposes it will soon carry its own refutation, and be estimated at its true value.

The city of Truro has recently prepared a sewerage scheme, and this was sent up to the Local Government Board for consideration in the ordinary way. Following this, it was decided to send a deputation to London to consult with the Central Board—a very excellent course to adopt—and also to pay a visit to Sutton, Surrey, and inspect the works there. The reports on these two visits have now been issued, and appeared last week in the *Royal Cornwall Gazette*.

THE DEPUTATION TO SUTTON.

First we will take the report of the Mayor, ex-Mayor, and City Surveyor, who formed the deputation to Sutton, where they were conducted over the sewage works by Councillor Wooton, ex-chairman of the Council. They report as follows:—

The present population of Sutton is 16,000, the average dry-weather sewage flow 500,000 gallons, the sewers being constructed on the separate system. The sewage disposal works were originally designed for chemical precipitation and broad irrigation, and were constructed in 1891-93. Owing to the effluent from these works not satisfying the Thames Conservators within two years of their completion, in November, 1896, the Council, acting on the advice of Mr. Dibdin, constructed the first bacteria bed for the treatment of crude sewage in the United Kingdom. This first bed was constructed by converting one of the chemical precipitation tanks into a bacteria bed by filling it up to 3ft. 6in. from the bottom with burnt clay ballast, and the sewage was applied to it on what is now known as the "Dibdin" or "Sutton" system of filling, viz., to allow the bed to fill nearly to the surface, to stand full for a given period. The effluent is then drawn off, and the bed allowed to stand empty for a given period to allow for aëration of the bed.

The success achieved was so great that gradually since then the whole of the chemical precipitation tanks have been converted into bacteria beds (one of them being utilised to form an open septic tank), and other new bacteria beds have also been constructed.

The works have been gradually extended, and the method now in operation is as follows: The crude sewage passes first through a small detritus tank and is conveyed to the open septic tank, the capacity of which is so arranged that the sewage passes through it very slowly. At the time of our visit a thick septic scum could be seen on the surface of the tank. The solids are all broken down by bacterial agency in the tank; and the effluent we saw coming away from it was practically freed from suspended matter. The open septic tank effluent is then run on to one of the first-contact bacteria beds. The bed is charged nearly to the surface,

after which the supply is stopped and diverted to the next bed. The sewage is allowed to remain in contact with the bed for two hours, after which the outlet valve is opened and the effluent is drawn off, to be similarly treated on the second-contact beds, the effluent from which is in a fit condition to be discharged into the brook. The bacteria beds are charged three times a day, an interval of rest being given of not less than two hours to each bed after its being emptied.

This mode of treatment of the sewage reduces the matters in suspension from 67·2 grains per gallon to 0·0, the oxygen absorbed from 3·517 grains per gallon to 0·578 grains and the albuminoid ammonia from 0·38 to 0·059 grains; whilst nitrification has taken place to the extent of 2·151 grains of nitrogen per gallon. The sludge is absorbed by bacterial agency in the process and does not accumulate or manifest itself. The first bed, put down in 1896, has continued at work almost without interruption without the renewal of the material, and when turned over in our presence was quite sweet and without any accumulation of sludge. Your Committee were very much impressed with the great simplicity of the process, the absence of expensive works and machinery, and with the splendid effluent which was being obtained.

THE CONFERENCE WITH THE LOCAL GOVERNMENT BOARD.

The same deputation met Major-General Phipps Carey, Chief Engineering Inspector, at his office, and the following is given as a *résumé* of the conference:—

General Carey laid stress on the necessity of your Council deciding for yourselves as to what system shall be adopted for sewage purification, as the Local Government Board cannot advise as to what system shall be adopted.

The Local Government Board consider the scheme recently submitted unworkable. Their reasons for rejecting it was not because it was experimental, for, if the scheme had been a practicable one, they might have gone further with it, but they were decidedly of opinion that it was unsatisfactory and insufficient, and, said General Carey, they were satisfied that it would not work at all.

General Carey would not commit himself definitely to advise as to a scheme, but his remarks certainly encouraged a scheme of bacterial treatment, and he urged the advantage in such a scheme of adopting septic tanks as part of the process, as they were peculiarly useful in places where it was necessary to economise fall. They might be either on the lines of the closed septic tanks as adopted at Exeter, or, perhaps better still, the open septic tanks as adopted at Manchester and other places, it having been shown by experiment that it was not necessary to have closed septic tanks. He expressed the opinion that very satisfactory results had been obtained by this process of treatment in septic tanks, and subsequent treatment on aërobic contact bacteria beds.

If, he said, your Council decided to proceed on these lines, on account of the oyster fishery, it would be necessary that the scheme should provide full provision for the settlement in tanks, and further treatment on first contact bacteria beds of adequate capacity in accordance with the requirements of the Local Government Board as to such works. He added, however, that although the Local Government Board had not hitherto sanctioned a scheme on these lines without requiring provision to be made for subsequent land treatment, it was probable that in this case, as the effluent was to be discharged into tidal waters, the Board would waive their usual requirement that land should be provided for final treatment. The only reservation he made to this statement was that they could not, of course, speak for the Board of Trade.

With regard to the proposed site of the works on the mudland below the quay, General Carey raised the objection that it was very limited in area for such a purpose, and did not offer that facility for expansion so desirable in such a works. He also expressed himself as somewhat doubtful as to whether the Local Government Board would approve of this site for the works on account of the close proximity of surrounding houses.

General Carey was questioned as to whether, considering that the effluent would discharge into tidal waters, it would be necessary in the proposed scheme to provide storm water filters to deal with the excess of storm water from three up to six times a dry weather flow in accordance with the present requirements of the Local Government Board. He stated that the scheme on paper must provide for this, and, if not actually constructed, your Council possess the necessary land and facilities for constructing them in connection with the works if required.

As the fall is limited from invert of sewer to low water, General Carey was asked if some additional beds, over and above their usual requirements, could not be provided, so as to make it possible, by means of this excess capacity, to utilise some of the beds for tidal storage, and allow of the bacteria beds being constructed of greater depth than would otherwise be possible, but General Carey expressed himself definitely that all the bacteria beds must have free outfalls at all states of the tides, and, consequently, independent tidal tanks would be necessary.

General Carey definitely expressed his disapproval of the last scheme. He stated that the method of filling or passing through the beds could only produce a straining action, that the beds being air-locked every tide they could not possibly work as bacteria beds, whilst his preliminary tank could not in any way be considered a liquefying tank. The scheme, he said, was not rejected on the grounds simply that it was experimental, but because they considered it was absolutely unworkable.

He considered that some competent engineer should be entrusted with the design of the works.

WHAT "AN EXPERT" SAYS.

On the same day that these two reports appeared in the *Gazette* an article was printed giving the "views" of "an expert" upon the Sutton process. Now ordinary provincial papers do not keep sanitary experts upon their staff, and it would be a little interesting to know whether this "expert" was called in by the editor or whether the opinion was proffered; also how he obtained copies of the reports. In order, we suppose, to emphasise his points, quite a number of words and passages were italicised, but we have dispensed with this, as there is really no need for it. We reprint the article in full:—

The process of sewage treatment and disposal experimented with by Mr. Dibdin at Sutton is called the double-contact system. As designed and worked at Sutton it involves the reception of crude sewage after screening the larger solids through a fine screen* upon a double primary and secondary set of so-called bacterial contact beds, and without precipitation or treatment in tanks. The primary bed is of coarse coke or clinker about 5ft. deep. The secondary beds are of finer coke, and about 4ft. deep. The sewage is run into the primary bed until it is full. This bed is then allowed

* The screened matter has to be removed and disposed of. This often amounts to a very serious quantity. At Leeds it amounted to 500 tons per million gallons daily flow per annum.

rest a certain number of hours. The effluent is then run off into the secondary filter bed, and the primary bed is left empty a certain time and then refilled. The secondary bed is worked similarly. There are generally about three fillings per twenty-four hours.

Theory of the process and expectation regarding its capacity to purify the effluent and deal with the sludge.—The theory of the process is that by allowing sewage to rest in the beds it can, by means of the coke surface, be brought into contact with certain bacteria which not merely liquefy some of the suspended solids but effect a purification in the dissolved matters as measured by the usual albumenoid and oxygen tests.

The original expectation was that (1) the solids usually deposited in a precipitation tank would all be dissolved or disappear in the filter beds, and that the sludge difficulty would thus be ended without tank treatment. (2) It was also supposed that the purification after two contacts would be sufficient.

Results of experiments.—(1) Has been completely falsified from the results of the recent experiments conducted by public officials at London, Leicester, Leeds, and Manchester, representing sewage of all characters, and in which the so-called "Dibdin" or "Sutton" system has been experimented with.

At Sutton.—The system carried out at Sutton is not regarded as a test of anything by the officials of the Local Government Board, nor is the theory of the system admitted by them to be practicable. The objection to allow free access to the works at all times, which prevails there, is also regarded as detrimental to any conclusions in regard to the results assumed to be obtained. It is easy to imagine that a body of municipal officials visiting Sutton and seeing no visible matter in the filter beds, or near the screen, not knowing the strength of the sewage, gazing at a carefully raked filter and being shown a bright effluent from the secondary bed, might imagine the whole problem solved. To those who have time to analyse and investigate there never was a more specious illusion, and it is now universally admitted by all the leading experts —Mr. Baldwin Latham, Professor Percy Frankland, Dr. Rideal, Dr. Clowes, &c.—that quite apart from the question of purification the suspended solids are only very partially dissolved in the filter beds, and that the irreducible residue is so considerable that the beds rapidly sludge up, and that settlement in a preliminary tank is absolutely necessary in order that even a very moderate flow per acre may be practically treated. In fact, the whole theory of the Sutton system has been swept away by the results of practical experiment, and we come back to tanks and tank treatment as a necessary preliminary process. Thus the Manchester experts say. (Report, page 26.) Conclusion :—(1) "The suspended matter must be removed, as far as possible, by sedimentation," and they recommend the use of the "tanks already existing at Davyhulme." Under the heading "Later Improvements," &c., they say "That the sewage passing on to the bacterial beds should, by means of these tanks, be not only free from suspended matter, but also rendered of more uniform character," &c. This means that the tanks are to do the very work which, by the Sutton theory, the double-contact beds ought themselves to do, and which constitutes the only *raison d'être* for the system.

Sludging up of the contact beds.—The necessity for the preliminary tank has arisen out of the rapid sludging, loss of capacity, and choking of the filter beds by the suspended matter. At the following places where the double contact-bed system has been tried the rates of sludging are given as below. These are from several recent official reports.

Double-contact Beds Loss of Capacity.

Place.	Days of working.	Per week as percentage of original water capacity.	Time in which filter completely choked. Months.
Leeds	487	2·1	13
Manchester ...	220	1·0	22
London	525	1·2	19
Average		1·4	18

Filters useless in one and a-half years.—That is to say the filters are completely choked in one and a-half years; even with a domestic sewage like that of London. In the Leeds report it is said, "The real difficulty with contact beds is to maintain capacity." "The hope that accumulations would be dissolved by rest has not been fulfilled at Leeds." Only by working them (the beds) at the rate of one filling of 25,000 gallons per twenty-four hours could the continued life of the rough bed be secured, and even then the ultimate choking seems inevitable owing to the retention in the bed of matters which, although organic,† have reached an irreducible condition, and which could not be consumed by resting the beds." (To show what the above one filling per twenty-four hours in order to avoid sludging would lead to in the way of filter area, it is only necessary to say that the Leeds double-contact beds were equal to half an acre one yard deep. Twenty-five thousand gallons per day on this area would mean that for one million gallons daily flow the filter area would have to be no less than twenty acres.)

At Crossness and Barking.—Dr. Clowes began trying crude sewage on double contact beds *à la* Sutton. He is now trying to diminish the choking by previous sedimentation in tanks. In his last (third) report he says: "A rough process of sedimentation was effected at the southern outfall by allowing the crude sewage to flow through a large tank on its way to the coke-bed. This sedimentation considerably retarded the choking of the coke-beds" (Part III., page i.). He also says: "The acre bed, which receives the effluent from chemically‡ treated and sedimented sewage, has yielded better results than the smaller experimental beds" (which receive crude sewage). It is the same tale all round. The practical objections detailed above are so prohibitive that it is hardly necessary to allude to (2) the purification.

The purification produced by the Sutton process.—In any case this is not great. Measured by the albuminoid ammonia, the first seven months at Sutton¶ gave a total reduction of only 80 per cent. from the crude sewage, and a figure for the second filtrate of 1·6 parts per million, which is not much better than a good chemical tank effluent, and far inferior to that yielded by the single coke filtrate of the same. In London Dr. Clowes got the following for the second final filtrates :—

	Depth. Feet.	Percentege total purification. Albuminoid.	Oxygen.
London (double-contact beds—coke)	5	63	59
Do. (coke)	10	—	76

By a good chemical process the reduction can be 83 per cent. to the tank alone, and 94 to the filtrate, which is far superior to the above. At Leeds a reduction of about 85 per cent. was got from the crude sewage for albuminoid, but the second filtrate averaged about 1·5 parts per million albuminoid, which is below the Mersey and Irwell standard.

The bacteriological and sanitary aspects of bacterial effluents.—The experiments conducted by Dr. Clowes

† This is specially noted so that it is not mere grit or mineral. It shows that the bacteria either cannot tackle some or the organic at all, or else they produce the stuff themselves.

‡ And such chemical treatment only 3 grains to the gallon.

¶ Mr. C. Chambers [Query Mr. C. Chambers Smith] has given figures which show a total purification of 85 per cent. from the crude sewage.

on the Sutton system, and the bacterial examination of the effluents from various double and single-contact beds at Barking and Crossness under the direction of the London County Council, are the most exhaustive yet made, especially in regard to the bacterial character of the final effluent. The final conclusion is stated thus :— "In view of these results only one conclusion seems possible, viz., that . . . the effluents from the bacterial beds cannot reasonably be assumed to be more safe in their possible relation to disease than raw sewage slightly diluted, but otherwise unaltered in its bacterial composition." In popular language the disease microbes occur in the effluents just as much as in the sewage.

It seems impossible to doubt that a thorough chemical treatment in the tanks, by which a large portion of the dissolved, and the whole of the suspended solids (which are assumed to be the chief pabulum of the bacteria) are precipitated to the bottom, would leave an effluent which would not be open to the same objection, and which, while admitting of purification in regard to its dissolved matter by the action of the ordinary saprophytic or non-pathogenic bacteria of putrefaction, would yield a filter effluent which would be probably freed from the pathogenic or disease-causing species. The double or multiple-contact bed system, without previous tanks, known commonly as the "Sutton system," is regarded as dead. It received its funeral oration at the reading of Dr. Clowes' paper before the Society of Arts last year.

MR. DIBDIN REPLIES.

Knowing the interest taken in this matter by our readers, we have thought it wise to bring the above article under the notice of Mr. Dibdin, and to give him an opportunity to reply. Of course, the article shows so much bias that its value is considerably weakened. At the same time, when such statements are made—even anonymously— it is well they should be dealt with at once. We have received the subjoined reply from Mr. Dibdin :—

Sir,—I have read with much interest and amusement the observations by "Expert," printed above, and kindly brought under my notice by you. Since "Expert" is evidently so thoroughly satisfied of the accuracy of his statements that he does not consider it necessary to authenticate them by giving his name, it would, in a general way, be only right to take no notice of the statements made, but in view of the widespread interest on the question and its great importance, no hesitation need be felt in exposing the fallacy under which this disinterested gentleman is labouring.

It would occupy too great space to criticise all the statements in detail. The main points may be summed up in the general conclusion that because two of the old precipitation tanks at the Sutton works have been utilised as grit or sedimentation tanks, therefore the whole system of bacteriological treatment, as opposed to chemical precipitation, followed by sludge pressing, is utterly fallacious, dead and buried! "Expert" exults over the idea that the sewage at Sutton at present passes through a preliminary tank, and evidently assumes that this is equivalent to the tank known as the "septic." The fact is that if the Sutton grit tank was arranged on that system it would have to be about ten times its present size, and then arched over, whilst at present it is only covered with the galvanised iron sheeting, which for some unknown reason was originally placed over all the precipitation tanks, and has been removed from the majority when they were turned into bacteria beds.

If "Expert" had put the shoe on the other foot, and said that the "tank" system, "septic" or otherwise, was a complete failure until the bacteria beds—first worked out and introduced to the public at Barking Creek and Sutton—came to its rescue, and first showed how sewage could be purified effectually without the use of expensive land, chemicals, or sludge presses, he would have been within the facts. For a fact it is, that until the work in connection with the purification of the Thames was undertaken and published, and in connection therewith the bacterial principle definitely enunciated by the writer and Dr. Dupré, adopted and followed up by Massachusetts, and put into practical form at Barking Creek and Sutton, the whole question was in a state of chaos. Sutton, from the first, has been an experimental works on purely scientific lines. The principles originally adopted are those in work to-day. Because trifling modifications are introduced from time to time, it is utterly preposterous for "experts" to talk of the "Sutton system" being *dead*.

Thus far on the general question. There are two statements which show the degree of reliance to be placed on the article: (1) That the officials of the Local Government Board do not regard the Sutton experiments as a *test of anything*. (2) That free access is not allowed to the works at all times.

With regard to (1), whatever may be the opinion of the Local Government Board "officials," it is a fact that the Board have sanctioned numerous schemes based upon the Sutton lines, and that those schemes, as many of your readers are aware, are in successful operation.

With reference to (2), viz., that free access is not allowed to the works, this is absolutely untrue. Any person or persons can obtain access to the works at any time, day or night, or for any periods they may desire, on application to the Engineer to the Council, Mr. C. Chambers Smith, and no notice need be given.

The only reason for asking deputations to arrange as far as possble for a particular day is that when the process was first at work deputations kept arriving at such a rate that the work of the attendants was seriously interfered with, and it became an urgent necessity to ask visitors to keep to certain times in order that the men might get on with their work. If any person, of whatsoever kind or persuasion of thought, desires to inspect the working of the system, he has only to state his business in a proper manner in order to at once obtain full permission from the Engineer to stop on the works for as long as he pleases, and, if desired, Mr. Chambers Smith will at any time issue an undated order to view the works, which may be utilised by the bearer at such date or hour as he, the bearer, may afterwards determine, and moreover empower him to take samples for analysis at any hour—a privilege which very few Local Authorities in the kingdom will allow.

The fact is that the Sutton system, as it is called, has been a heavy blow to the large number of folk whose interests were bound up with this, that, or the other patent scheme. The introduction of a simple and yet unpatented method of overcoming so many of the old-time sewage worries came as a sad shock to many, who are evidently, judging by the tone of "Expert's" article, only too glad to point to any slight modifications, whether improvements or not, and say, "Ha! ha! See, they have altered it. It is not the same in every detail and iota. They are using a grit chamber instead of a screen; they use a syphon instead of a hand-valve. Ha! ha! Their old 'system' is *dead!!* and we have heard its *funeral oration!*"

This puts one in mind of the old joke about the Scotch elder whom his enemies wanted to worry; so they took a coffin to his home, and told him that he was dead and must be buried. "But I'm no dead!" says he. "Yes, you are dead, and here's your coffin to prove it."

To the quotation from Dr. Clowes' report the following should be added, and it must be remembered that the Crossness experiments were not carried out with a view to obtaining the maximum degree of purity possible. "In the biological treatment no chemicals

are required, and no offensive sludge is produced. . . . However desirable it may be to obtain an effluent chemically pure, and, at the same time, bacteriologically above suspicion of danger, a process which leads to the solution of the great mass of suspended matters in the raw sewage, which effects a striking reduction in the amount of putrescible matters, which avoids the use of chemicals and the accumulation of offensive sludge, which yields an apparently non-putrescible effluent, and which is at the same time practicable, is one which presents such singular advantages over chemical treatment, and which produces such satisfactory results in view of all the requirements of the case, that it would be idle to deny its value or attempt to minimise its usefulness simply because it falls short of a standard of absolute perfection."—I am, Sir, yours faithfully,

W. J. Dibdin.

ROYAL INSTITUTE OF PUBLIC HEALTH.

THE FORTHCOMING CONGRESS AT EASTBOURNE.

PROVISIONAL PROGRAMME.

The provisional programme of the arrangements of the Congress of the Royal Institute of Public Health, to be held in Eastbourne next July, has just been issued by the local Executive. It will be noted that the Duke of Devonshire, who is the president of the Association, will deliver an inaugural address. Both the Duke and Duchess are taking the liveliest interest in the arrangements, and their active co-operation cannot but enhance the success of the Congress.

The railway companies will issue return tickets to Eastbourne to delegates at a fare and a quarter. The London, Brighton, and South Coast Railway will issue return tickets from Eastbourne to neighbouring places to delegates at a fare and a quarter during the Congress. Drives will be organised to various places of interest in the town and neighbourhood, and visits in connection with sanitary matters, drainage, &c. Special facilities are being arranged for delegates in connection with entrance to Devonshire Park, the Social and Political Clubs in Eastbourne, the Royal Eastbourne and Willingdon Golf Clubs, the Eastbourne Cricket and Football Club, the Upperton Lawn Tennis Club, the Compton Croquet and other clubs, the theatres, steamers, bathing, &c. A special guide book (with maps) is being prepared for delegates.

THE PROVISIONAL PROGRAMME.

Following is the provisional programme, which will be subject to minor alterations:—

Wednesday, July 24th.

10 a.m. to 4 p.m.—Reception Room, Grove Hall, open for information for delegates, issuing of tickets, &c. This Reception Room will be open daily throughout the Congress from 9 a.m. to 4 p.m. for the purposes above mentioned.

Thursday, July 25th.

9 a.m.—Reception Room open.
3 p.m.—Informal reception of delegates by the Mayor in the Reception Room of the Town Hall.
Delegates and others will wear their chains of office and academical or municipal robes; delegates will robe in Mayor's parlour.
3.30 p.m.—Opening address by His Grace the Duke of Devonshire, K.G., in the Town Hall.
4.30 p.m.—Reception by the Eastbourne Cricket and Football Club in the "Saffrons," adjoining the Town Hall.
8 p.m.—Reception by the Right Worshipful the Mayor and Corporation of Eastbourne.

Friday, July 26th.

9 a.m.—Reception Room open.
9.30 to 1 and 2 to 4 p.m.—Meetings of sections.
4.30 p.m.—Garden party.

Saturday, July 27th.

8.30 a.m.—Reception Room open.
9.30 a.m.—Excursions to Battle Abbey, Arundel, Normanhurst, &c., by kind permission of His Grace the Duke of Norfolk, the Right Hon. Lord Brassey, K.C.B., and others. Excursions by sea to the Isle of Wight, &c.
8 p.m.—Special Concert at the Devonshire Park.

Sunday, July 28th.

10.30 a.m.—Assemble at the Town Hall.
11 a.m.—Special Service at St. Saviour's Church, attended in State. Probable preacher, the Reverend Dr. Merry, rector of Lincoln College, and Public Orator Oxford University.
(Delegates and others will wear their chains of office and academical or municipal robes).

Monday, July 29th.

9 a.m.—Reception Room open.
9.30 to 1 and 2 to 4 p.m.—Meetings of sections.
4 p.m.—Visit to Lewes, and Garden party at Glynde, by kind invitation of Admiral the Hon. T. S. Brand. Special train, 4.15 p.m.
8.30 p.m.—Ball and reception at Devonshire Park.

Tuesday, July 30th.

9 a.m.—Reception Room open.
9.30 to 1 and 2 to 4 p.m.—Meetings of sections.
4.30 p.m.—Closing meeting of the Congress at the Town Hall.
7 p.m.—Congress dinner.

Wednesday, July 31st.

9 to 11 a.m.—Reception Room open. Excursions will be arranged for those delegates remaining in Eastbourne, if wished.

Changes at the Local Government Board.—The President of the Local Government Board has appointed Major-General H. Darley Crozier, R.E., to be Chief Engineering Inspector of the Local Government Board in the place of Major-General C. Phipps Carey, R.E., who has retired. Mr. G. Waller Willcocks, M. Inst. C.E., has been appointed Deputy Chief Engineering Inspector, in succession to Major-General Crozier. The President has also appointed Mr. Brook Taylor Kitchin to be Architect to the Local Government Board in the place of Mr. P. Gordon Smith, who has retired.

Rotary Sewage Screens.—Messrs. John Smith and Co., of Grove Works, Carshalton, Surrey, have recently supplied one of their patent rotary sewage screens to the Guildford Corporation, where it runs day and night, driven automatically by a small water-wheel, utilising the flow of sewage which is being screened. The cleaning of the travelling wire screen is also effected without attention by means of a revolving circular brush. The apparatus is at work now at several sewage farms, and is giving great satisfaction, the gratings and rakes being entirely superseded, and the sewage being freed in a more satisfactory way than before from paper, rags, &c., before going on to the bacteria beds. Even where a septic tank is used, it is found desirable to subject the sewage to a preliminary rough screening, and save the tank some of the heavier work it has to perform.

THE POWERS OF SANITARY AUTHORITIES IN REGARD TO INSANITARY HOUSE PROPERTY.

By E. Hugh Snell, M.D., B.Sc., &c., M.O.H. City of Coventry.

The extent to which a Sanitary Authority should be allowed to interfere with the rights of private property —or rather the extent to which the magistrates should be allowed to do this, for this matter under existing law is entirely in their hands and out of the hands of the Local Executive Authority—may form the subject of a variety of opinions. But when we have for the moment left out of consideration those landlords who are desirous that property owned by them and let by them to poor people shall have at least the elements of habitableness, and who are willing to effect any reasonable improvements; and when we consider the property of a different class of property-owner who will do absolutely nothing, unless compelled, in connection with his property beyond collecting the rent, we then reach a subject on which a greater unanimity of opinion will prevail, and it may be submitted that the powers at present existing for dealing with this class of property and this class of property-owner are not nearly summary enough.

The construction of new streets and houses can be properly supervised and controlled by the employment of the powers of very carefully constructed bye-laws; such particulars as the width of streets and passages, the area to be left in front of and in the rear of dwellings, the thickness and the height of walls, the size of windows, the ventilation of rooms and sub-floor spaces, and the arrangement of the drainage of houses, can all be controlled by such bye-laws; it is not possible, however, to make such bye-laws retrospective; it is clearly not possible to apply such bye-laws to old buildings; its desirability no one can question; but what is desirable is unfortunately not always feasible. It is always easy, and probably for a very long time it will be easy, for the amateur sanitarian to point to irregular, unsightly houses, to narrow streets, to still narrower courts, to small windows, to rickety chimneys, to dirty and impoverished rooms, to ill-ventilated pantries, and numerous other undesirable details; the amateur sanitarian, however, does not usually enter into details, he generally refuses to differentiate between the defects which are due to the landlord and the filth which is due to the tenant. After very mature deliberation I am prepared to submit the most unpalatable probability that although there are houses that are unfit for people to dwell in, there are also people who appear to be unfit to dwell in houses. We can compulsorily cause the landlord to cleanse houses; we cannot compulsorily cleanse people or make them cleanly in their ways.

I have myself visited houses, limewashed on an order of the Sanitary Committee six months previously, with still the marks of the bespattered limewash on the furniture, the floor and the stairs, as though the workmen had been in the day before. It may be the landlord's place to keep the walls and ceiling cleanly, it is the tenant's duty to keep the floors clean. It is one thing to see that a sufficiency of windows exist; it is quite another to open them occasionally. It is one thing to see that a fire-place and chimney exist for the proper ventilation of a bedroom; it is quite another to prevent the tenant from closing it by pasting paper over it; it is one thing to open up a pantry by an adequate ventilation opening, it is another to prevent that opening from being plugged by rags; it is one thing to provide proper water-closet accommodation outside the house, it is another to cause a tenant to empty slops and excrement until lack of utensils of various descriptions compels him to do so. Such remarks as these may apply only to the worst class of tenants, but even so, they are true—they are not fables. The problem therefore of the improvement of the houses of the poorer classes is not simply one of building new houses for them, it involves other questions as well. Of course, it is often said that if the houses were improved the habits of the tenants would improve also. This may be so. It is, however, only partially true. Habits are not simply the result of environment. There are many houses in courts in this city which on a casual examination externally appear very undesirable residences; a mere step inside, however, will show that a thrifty, cleanly tenant has made the house as clean and wholesome as any well carpeted mansion.

In expressing an opinion that a house is not fit for habitation it is not merely necessary to opine that such a house would not be allowed to be built now-a-days, it is necessary to formulate the particular points about it which actually render it unhealthy. A house cannot be condemned as unhealthy merely because it is a back-to-back house. Some large towns allow such houses to be built to-day. One has to bear in mind the standard of habitableness which is regarded as the standard of the moment. I hope a time may come when no house will be regarded as fit for human occupation which has not an accessible bath room. The day has not yet come, however, when this desideratum can be laid down as a necessity of human existence. One has to advance gradually, employing the legislative tools so far permitted by public opinion, and the laws of the land, which are presumed to express that opinion.

One further somewhat popular error in regard to this matter it is necessary to mention. It is sometimes supposed, one would gather from some speeches in public, that a Sanitary Authority can not only close houses at will, but also demolish them with a mere stroke of the pen. This is not so. It is the magistrates only who can close houses, and as for demolishing them, you can only demolish them by buying them. That is what the law on the subject practically amounts to. Large improvement schemes may accomplish much. It is, however, for your city to decide, through its representatives, how far it is prepared to go in the matter of large improvement schemes.

MUNICIPAL SANITARY INSPECTORS FOR BOMBAY.

Dr. Turner, the Health Officer of Bombay, has drawn up regulations for the examination and instruction of candidates for appointment as municipal Sanitary Inspectors. The regulations provide that the examination shall be technical, and shall be conducted by written, oral, and practical tests upon the following subjects, so far as they bear upon the duties of a Sanitary Inspector:—(1) Elementary physics and chemistry in relation to water, soil, air, and ventilation. (2) Elementary statistical methods. (3) Municipal hygiene or hygiene of communities, including prevention and abatement of nuisances, sanitary defects in and about buildings and their remedies, water supplies, sanitary appliances, drainage, refuse removal and disposal, offensive trades, disinfection, food inspection. (4) Bombay Municipal Act Statutes, and the Orders, Memoranda, and Model Bye-laws, and the Bye-laws in force in the municipality of Bombay. A syllabus of the various subjects is provided, and it is added that each candidate will be expected to report on the sanitary condition of a house and send in a plan. The books recommended for candidates are Reid's "Practical Sanitation"; Taylor's "San. Inspector's Handbook"; Corfield's "Laws of Health"; and Chapman's "Guide to Success in Sanitary Inspectors' Examinations." The recommendation of Mr. Chapman's recent book so soon after publication is a high tribute to the value of the work, and an event upon which the author is to be heartily congratulated.

WHERE THE SEPTIC TANK SYSTEM EXCELS.

The following extract from a paper on the "Purification of Sewage by Bacterial Methods," read by Dr. Leonard P. Kinnicutt, D.Sc., Professor of Chemistry, Worcester Polytechnic Institute, before the New England Waterworks Association, is striking testimony to the septic tank system of sewage treatment.

"The real practical value of the septic tank is that it destroys suspended matter without forming any very great amount of sludge or precipitate, thus having an advantage over any chemical precipitation process; that it seems to bring cellulose into at least partial solution, thus preventing the coating over of bacteria beds, either those of intermittent filtration or contact, with a layer more or less impervious to water; that it breaks up the more complex organic compounds, forming substances that are more easily acted upon by the nitrifying bacteria than the compounds in raw sewage. In a few words, it is a process which prepares the sewage for subsequent treatment on bacterial beds, either those of the double-contact system or those of the intermittent filtration system. And if I were asked what was the most important step in advance that had been made in sewage treatment during the past ten years, or since the report of the Massachusetts State Board of Health, I think I would answer, the recognition that sewage purification should, for the best results, take place in two stages, and the devising of a method, as the septic tank treatment, for breaking up the complex organic compounds and bringing a large part of the suspended matter into solution.

"Without some preliminary treatment, I feel convinced that any system for treating large quantities of sewage on limited areas, like the double-contact system—which is absolutely necessary for many cities—is doomed to failure, and I also feel convinced that with the intermittent filtration method much more satisfactory results could be obtained if the sewage first received septic treatment."

CORRESPONDENCE.

(*To the Editor of* The Sanitary Record.)

(*We do not in any way hold ourselves responsible for opinions expressed by our correspondents.*)

NUISANCES FROM TANYARDS.

Sir,—I have read with much interest in the *Liverpool Courier* an article dealing with your valuable observations on sanitation, and more especially local smells which constitute a nuisance, causing sickness and discomfort.

I wish to put a case before you of a nuisance through which numbers of people are made more or less ill, as probably you or your readers might be able to offer me some suggestions as to the best means of securing relief. I happen to live in a district where there is a tannery. This has been long established, and until the last few years was conducted in such a way that nothing very objectionable could be noticed. Some new process of tanning has been adopted, the nuisance arising from which is decidedly injurious to health. Ourselves, visitors, and servants suffer seriously through it, and many people around have a sad tale of woe to tell in consequence of these vile smells. A county Medical Officer of Health and his wife have just left our house, and the latter has been made seriously ill several times during her visit. Her husband has been troubled in a less degree, and considers the nuisance "atrocious."

The Local Authorities have had the matter under consideration for more than twelve months, and have done nothing. Perhaps you could tell me the best course now to take, and if you or any of your readers could give me any information as to the nature of these recent methods of tanning I should be glad. Such horrid vapours do not arise from any other tanneries that I know of, but I understand that wherever the same special and secret process is adopted similar disastrous results are experienced.—Yours faithfully,

Desideratum.

FACTORY AND HOME-MADE CLOTHING.

Sir,—I am extremely obliged to Mr. Finlay for his interesting contribution to the other side of the question. Let me say at once that personally I do not care where my clothes are made, so long as they are made by healthy workers, in properly lighted and ventilated workrooms, which are clean and in good sanitary condition. As a unit in the rapidly increasing numbers of the general public who take a keen interest in all that pertains to hygiene, I feel that the question should be dealt with. My contention is this—that all garments should be made under the personal supervision of the master tailor on his own premises, in properly constructed, ventilated, lighted, and heated workshops, which should be kept clean and in proper sanitary condition. I further suggest that special attention should be paid to such workshops by the Factory Inspectors. If my suggestion is carried out, I feel convinced there would be fewer instances of untraceable infectious cases. The only clothing factory I ever visited was the very opposite of that instanced by Mr. Finlay—everything was bright and cheerful—and the workers looked the picture of health. I trust that other readers will give you the benefit of their experience.—Yours faithfully,

J. Robinson.

London, June 8th.

Sanitary Inspectors' Associations.

NATIONAL UNION.

Arrangements are being made for the annual meeting of the National Union of Sanitary Inspectors, Midland centre, to be held at Tamworth, on Saturday next. It is proposed to pay a visit to the castle, and also, by kind permission of Mr. Kelly, to Drayton Manor. Mr. George Reid, M.D., D.P.H., Fellow of the Sanitary Institute, and County Medical Officer for Staffordshire, is President of the Union.

National Health Society.

OFFICIAL TRANSACTIONS.

It has been decided that the annual distribution of certificates, &c., shall be postponed until the autumn. It is hoped that H.R.H. Princess Christian will herself present the certificates later in the year, and it is for this reason that the meeting is postponed, it being felt that all candidates and members of the society would prefer this arrangement.

The lecturing work in the County of Monmouth has not yet ceased, application has just been received for examinations in two centres. This will practically bring the work in rural districts to a close for the season.

NOTICES.

ANNUAL SUBSCRIPTIONS.—The Annual Subscription to "THE SANITARY RECORD," for the United Kingdom, paid in advance, is 12s. 6d. For the Colonies and Abroad, 15s This includes postage, and a Copy of the Diary, post free.

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ADVERTISEMENTS cannot be inserted unless received by first post on WEDNESDAY morning.

ALL Communications should be addressed to the EDITOR, at 5, FETTER LANE, LONDON, E.C., and Cheques and Postal Orders should be made payable to THE SANITARY PUBLISHING COMPANY, LIMITED.

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The Sanitary Record
AND
Journal of Sanitary and Municipal Engineering.

JUNE 13, 1901.

NATIONAL HONOURS FOR PUBLIC HEALTH WORKERS.

THE bestowal of national honours upon public men, other than those attached to the Army, the Navy, and the Civil Service, is a question in which public health workers have a direct interest. It has long been a matter of notoriety that the guiding principle in the distribution of these honours has practically debarred public servants other than those belonging to the classes referred to from participation. From time to time, it is true, the services of literature, art, and science, not even excluding the drama, have received tardy recognition from the State. Medical science has also to a certain extent been acknowledged; but officials engaged in the administration of local government, with one or two exceptions where big reputations were concerned, have been conspicuous by their absence. It is true that a few provincial mayors have from time to time figured in the periodical honour lists; but these honours, so far from being accorded for any conspicuous ability on the part of the recipients, have been mostly the result of functions in which Royalty has played a prominent part. Some passing event, such as the laying of a foundation-stone of a Jubilee hospital by a member of the Royal Family, or the entertainment of the august visitor by the local magnate, has brought the latter into prominence, and honours have followed in due course. While we do not begrudge these gentlemen, many of whom socially and politically leave little to be desired, the titles conferred upon them, we fail to see in what respect they have a prior claim over men who have rendered valuable services to local government in an official capacity. The Borough Engineer, for instance, who by dint of years of unremitting toil, has transformed ugliness into beauty; and the Medical Officer, who has kept disease at bay—surely these should not be forgotten. The Public Health service is assuredly not the least among local administrative bodies, nor is the work its officers perform among the least important of the various links that go to form the chain of our national prosperity. And while we place special emphasis upon this particular branch of local government as being the one in which we are naturally most interested, we do not blind our eyes to the fact that in other branches the same argument holds good. There are hundreds of men engaged in Council and Poor Law work whose services to the State cannot be over-estimated. Some of them have given such services gratuitously, and the least that a Government could do, one would think, would be to express its gratitude in the manner suggested. A perusal of the lists of honours issued from time to time reveals the very patent fact that back-stair influence in this direction has accomplished more than actual merit; the modest man has been brushed aside, while the man with a "friend at Court," and frequently little else to recommend him, has stepped in and secured the coveted prize. Up to very recently those whose claims we are putting forward appear to have lacked an advocate, but Mr. Thomas Farrow, the able editor of our contemporary the *Councillor and Guardian*, has stepped into the breach. Convinced of the necessity of someone moving in the matter, he recently called the attention of the Right Hon. Walter Long, M.P., President of the Local Government Board, to the facts, and has, we are glad to announce, secured a definite promise from him that the suggestion should receive every consideration. Thus encouraged, Mr. Farrow went a step further, and submitted a list of typical public men whom he considered ought to be "in the running" for national honours. Needless to say, we at once assured Mr. Farrow of our desire to co-operate with

him, and he has signified his appreciation of the same in a very cordial manner. In the meantime we should be glad to have the views of our readers upon the subject. We feel convinced that a strenuous advocacy is all that is needed to bring about the desired results.

British Dairy Farmers in Congress.

The annual Congress of the British Dairy Farmers' Association was held this year in Scotland, the chief centres visited being Kilmarnock, Glasgow, and Edinburgh. The delegates seem to have had both a pleasant and a profitable time. From the reports of the proceedings two points emerge with special prominence—the proposed legal standard for milk, and the question of the pasteurisation of milk. The first of these points was the subject of considerable comment at the closing dinner, and the opinion of all those who referred to the matter was that the adoption of a fixed standard of 3¼, or even 3 per cent. would be found to be impracticable. Mr. George Barham, London, humorously remarked that if the proposed standard were to become law he feared that he and many others of those present would be unable to attend that year's Conference, as they would probably be doing their six months in prison! Another speaker, in the same strain, expressed his conviction that the fixing of a 3 per cent. standard would result in nine-tenths of the distributors of milk being brought into court within a year; and another, that the law could not make possible what science and practice had hitherto failed to make possible. Similarly, Dr. Drinkwater, Analyst to the Edinburgh Dairykeepers' Association, gave it as his opinion that the question of the milk standard would settle itself, for if they passed an impossible law it would simply fall into abeyance. These, it will be observed, are the views not of dishonest farmers or dealers who are only anxious to shield themselves, but of those who represent the most enlightened and advanced opinion connected with the trade, and whose chief desire is to maintain the purity of our milk supply, and as such they deserve the fullest consideration. The other matter, the question of the pasteurisation of milk, formed the subject of an interesting paper and discussion at one of the meetings. Mr. James Stirling, Glasgow, who read the paper, described the various processes minutely—first, the method adopted in Denmark, by heating the milk to 185 deg. Fah., and cooling it immediately to a temperature of about 50 deg., together with the use of a pure lactic ferment, to start the ripening of the cream. To obviate the distinctly cooked flavour which the milk acquires by this process, another method has, however, been adopted—by retaining the milk at a temperature of 160 deg. Fah. for twenty minutes before cooling it down. Mr. John Speir, Newton, who was, if we recollect aright, one of the members of the Royal Commission on Tuberculosis, said that he was old-fashioned enough not to believe in these methods; for if attention was directed to securing proper conditions at the source of supply, they would so far reduce the risk of contamination as to render pasteurisation unnecessary. The general opinion seemed, however, to be that this was a counsel of perfection, and that the danger of contamination in the dairy, through the germ-laden atmosphere of the byres, and the other conditions under which cows are milked was so great, that it was practically impossible to keep the milk pure until it was delivered to the public without recourse to pasteurisation, which was the only absolutely safe plan; and further, it would be found by the dairyman to pay more than by the use of antiseptics. Otherwise it would be hopeless to expect dairymen to adopt it.

What is Pure Sugar?

A decision of considerable importance under the Food and Drugs Acts was pronounced in the Sheriff Court of Edinburgh last week in a case against the Home and Colonial Stores, Limited. There was no dispute as to the facts. An Inspector under the Acts went into the shop and asked for a pound of sugar at a penny. He was told that owing to the new tax the sugar formerly sold at a penny per pound was now sold at 2½d. for two pounds. He took two pounds, and the sugar on analysis was found to contain 2·24 per cent. of mineral matter, chiefly potash salts, and 3·76 per cent. of water. On these grounds the seller was charged with having sold an "article not of the nature, substance, and quality of the article demanded." The analysts for the prosecution maintained that there was no necessity for the presence of these ingredients in pure sugar, and they could have been got rid of by proper refining. It was not, however, alleged that they were foreign to the sugar, *i.e.*, that they had been introduced. They were native to the sugar, and the removal of the impurities and the production of pure sugar was only a question of extra trouble and extra expense. Among the witnesses for the defence were chemists and analysts of repute, and two sugar refiners, who stated that absolutely pure sugar was unknown in the commercial world. They denied that there was any recognised standard of purity; it varied according to price. The alleged offence appears, therefore, to have consisted not in adulteration, such as the addition of sand, for a fraudulent purpose, which is what the Food and Drugs Acts are aimed at, but in not having rendered the sugar sufficiently pure. The real questions in the case accordingly came to be—"What is sugar?" or, rather, "What is sugar at 1¼d. per pound?" and was the Inspector supplied with the article he asked for? The prosecutor contended that sugar containing 99·5 per cent. of sucrose was a well-known article in the trade, and that when a purchaser demanded "sugar," it was pure sugar that he should get. The Sheriff, in giving judgment, held that this proposition could not be maintained, and that the Inspector had got what he had asked for. He asked not simply for "sugar," but for sugar at a certain price, and he got the article sold throughout the trade at that price. That being

so, he could not be held to have been "prejudiced" by the sale. It was established by the evidence that the word sugar was a wholly indefinite expression, and that sugar of at least four kinds were known in the sugar trade. The argument that the purchaser demanding sugar at 1¼d. per pound must get pure sugar was met by conclusive proof that pure sugar containing 99·5 per cent. of sucrose would be quite unsuitable for the purposes for which the cheaper sugar was bought. The cheaper sugar was very soluble, and was largely used in cooking and for eating with fruit, while "pure sugar" was not necessary for those purposes. The article asked for by the Inspector was ordered at its trade price, and had been supplied at the trade quality and the trade price. Nothing had been added to it for any purpose whatever, and all its qualities were native to the article. It was a perfectly wholesome article of food, and there was not the slightest suggestion of unfairness in the transaction. The complaint was therefore dismissed.

The United States and Tuberculosis

The Treasury Department of the United States has taken a firm line in dealing with tuberculosis. It has directed the immigration officials to consider tuberculosis as a dangerous and contagious disease, and the consequence will be that no more consumptive immigrants will be received in the country. The order will operate in bringing about a large decrease in immigration, but it will not stop there, for it will probably also affect the cabin passenger traffic. The step is a strong one to take, but with the now-received conceptions of tuberculosis it is perfectly defensible as a measure of self-protection. Will this country not have the courage to adopt similar measures for the protection of its population? We have strict regulations regarding cattle diseases, but where humanity is concerned, at least in the matter of tuberculosis, we allow complete liberty and freedom from restraint. And yet a very large proportion of our pauper immigrants must bring with them the seeds of this disease.

A Midland Sewage Scandal.

It is impossible to describe otherwise than a scandal the state of things revealed at the last meeting of the Newcastle-under-Lyme Town Council. The Medical Officer of Health reported that a most serious and continuous nuisance existed in consequence of the pollution of the Lyme brook by the Silverdale Local Authority. In substantiation of this charge, he stated that he found that practically the whole of the Silverdale sewage was turned into the Lyme brook in a crude state, without any real attempt at treatment being made. At one point the outfall sewer was fractured, and quite one-half of the contents (crude sewage) passed direct into the watercourse. In another place the pipe conveying the sewage from a small hamlet was fractured just where it crossed the stream, and the sewage flowed into the Lyme. He admitted there was some evidence of irrigation, but the thing was badly done because of the lack of any method in the work. He had tested the effluent and found that it was practically the same as crude sewage, "showing that irrigation alone was useless." It hardly seems possible that such a condition of things can exist. But we cannot understand why it has reached the present scandalous state. Such things do not come about in a day, and the Newcastle Town Council cannot be wholly exonerated from blame. The broken pipe and the defective outfall should have been remedied long ago. But, of course, the chief blame must be fixed upon the Silverdale Authority, which seems to be utterly oblivious to the dangers of its neglect. One of the Newcastle aldermen urged that proceedings should be taken against the offending Authority, but the prevailing opinion was that a warning would be sufficient. It may be, but we think there would be fewer such cases if action was taken occasionally. The idea of leniency is traded upon, and the day of reformation is indefinitely postponed.

Bootle's Medical Officer.

We are always glad to see Sanitary Authorities appointing whole-time officers, but when this is done adequate remuneration should be given for their services. When a small salary is offered, and we are told that a "thoroughly competent man" can be obtained for it, there is always the idea present that a place is being made for some one. Thus, last week the Bootle Town Council discussed the appointment of a successor to the late Dr. R. J. Sprakeling. Some of the members appeared to think that a salary of £350 per year was sufficient to pay a gentleman to act as Medical Officer of Health, visiting Medical Officer of the Linacre Fever Hospital, and surgeon to the police force and fire brigade. The one appointed is to give his whole time to these offices and be debarred from taking private practice. Now, even if it was the medical officership alone that was vacant, the amount is not sufficient for the post. Bootle is a town with over 60,000 inhabitants, and it is growing continuously. The £350 does not work out at £6 per 1000 inhabitants, which is considerably less than that paid by most Authorities for "part timers." Of course it is possible that someone with a private income is going to apply for the post, as one of the things said by the chairman of the Health Committee was that, although the salary was small, "he was informed that they would get a gentleman applying for the position who would be a credit to the borough." We contend that no public appointment should be made upon such an understanding. The conditions of all appointments should be settled on the qualifications and competency required in their occupants, and no other consideration should be allowed to prevail. We want the *best* men for the public health service, and such salaries should be paid as to attract the most competent, and not merely those who desire to supplement an already assured income.

Hospital Sunday.

Next Sunday the inhabitants of the great metropolis will have another opportunity of showing a practical sympathy with the many institutions which exist for combating disease in their city. The need of funds to carry on the work is greater than ever. It is painful to watch the advertisements in the daily papers pleading, almost piteously, for help, in order that hospitals and kindred institutions may continue their work. We agree with our contemporary the *Hospital*, that "our great London hospitals are not supported either by the patients who are so ready to avail themselves of the benefits to be obtained, or even by those who subscribe to them, but are in reality supported up to one-half of their total receipts by the charity of those who have gone before." In 1899—the last year for which complete statistics are available—nearly one million and three-quarter patients were treated in the voluntary hospitals and dispensaries of the metropolis. Their total income for the same period was £1,097,776. With but comparatively little more support, the work of these excellent institutions might be increased 50 per cent. In many of them beds, and even whole wards, are unoccupied for the lack of funds. "Year by year the number of the sick poor to be cared for must of necessity increase, and unless a sustained effort is made to meet the demands, Londoners will have to smart under the reproach of being so careless, so selfish, as to grudge giving adequate help to our suffering and less prosperous brethren. To plead inability is, in nine cases out of ten, mere dishonesty. We can all do something." Let the first Hospital Sunday of the new century mark an epoch in the history of the Fund. London was never richer than it is to-day—let its generous gift in a good cause never be greater.

Sydney's Annual Report.

We have received a brief synopsis of the annual report of Dr. Armstrong, Medical Officer of Health for Sydney, N.S.W. It contains one or two points calling for special mention. First, it records a departure in the engagement of health officials. These are still subject to the municipality, but the Government has the right of veto as to their dismissal. This, says the Doctor, "was a novelty so far as Australian municipalities were concerned, though it had been tried in Great Britain and elsewhere with successful results. The object was to render Sanitary Inspectors more independent than they otherwise would be—independent especially of the influences which occasionally intrude into municipal bodies. So far, the experiment had proved an undoubted success in Sydney. The men had been engaged on the strength of their qualifications alone, and this had been the only consideration allowed to prevail in the process of selection. The Inspectors appointed had all undergone a systematic course of instruction in sanitary matters, and had received certificates as to competence. The chief Inspector was a civil engineer of great experience, who, since his appointment, had repeatedly proved his value." This is only what was to be expected—when men are appointed to office on their merits, there is sure to be an improvement in the sanitary administration of any district. Another special matter mentioned is that a system of house-to-house inspection has been instituted, and with it the card system, under which every house possessing sanitary defects has a card to itself. On this are inscribed its character and sanitary history—the cases of sickness that have occurred there, and the deaths. Under the old style, separate entries were made from day to day, and, in hunting up records, much depended on the memories of the officials. These entries are still made, as they have been found useful, but absolute reliance is not placed upon them. To add to the value of the new system, information is daily received from the Registrar-General's Department as to the deaths in the city, and this has now become a matter of routine. With a more vigorous and watchful administration improvement has taken place in the health of the city, zymotic disease has decreased, and there is a decreasing death-rate.

Do Municipal Works Pay?

There are many critics who delight in denouncing "municipal trading," and who would have the people believe that it would be much better to leave all such things to private enterprise. But there are some hard facts to get over before they will ever convince the public that their criticisms are right. Here, for instance, is the record for last year of the municipal works of Sheffield. Until a comparatively recent date the Corporation possessed no source of revenue but the rates. It has now acquired the water undertaking, the tramways, and the electric lighting of the city. In 1863, during the existence of the Sheffield Water Company, the bursting of Bradfield reservoir was followed by an increase of 25 per cent. in the water charges. Last year, after the water undertaking had been absorbed by the Corporation, 12½ per cent. of this increased charge was remitted; but, notwithstanding this, a profit resulted on the working of £17,000. This year the net profit has increased to £25,400. The taking over of the tramways has been an equally successful venture. For the year 1899-1900 the number of passengers carried was over 19 millions, and during the twelve months just closed the total has risen to 34 millions, or very nearly double. The gross profit earned during the past year has been £48,657 6s. 10d., and, after the deduction of the sums necessary for interest, sinking fund, and maintenance, the net profit is still the handsome sum of £21,817 17s. 2d. Handicapped as they are with the burden of borrowed capital, the tramways since they came into the city's possession in 1896 have earned a total net profit of £64,624 10s. 2d., of which £22,000 has gone in the relief of the rates. If the electric light undertaking cannot furnish quite so satisfactory a result, it must be understood that it started under a severe handicap. The price paid to the old company was a very high one, and the charges for sinking fund and interest correspondingly heavy. The

balance-sheet this year shows a gross profit of £24,953 9s. 0½d., and the net balance is £4048 13s. 10½d. During the ensuing year the Corporation expect to make little, if any, profit out of the electric light, owing to the large amount of unproductive expenditure which a contemplated alteration in the system will involve. A net profit of £50,000 for one year will take a lot of explaining away, and proving that municipal trading does not pay.

MUNICIPAL ENGINEERING & SURVEYING.

CROSS-TABLE CHAT.

The Municipal Officers' Association, which was started a few years ago with the following points for its programme, viz.:—"To bring Municipal Officers into direct association with one another, and generally to promote their interests; to secure adequate superannuation for Officers of Local Authorities; to encourage the study of and to arrange opportunities for the discussion of Local Government questions, and of any judicial decisions and proposed legislation relating to such questions," is making good headway, more especially in the South of England, and I venture to assert that before many years it will exercise a very powerful influence for the protection of Municipal Officers and for the promotion of unity of action on Local Government questions.

Such an Association should be supported by all public officials, for by co-operation their mutual interests can be advanced, and the more numerous its members are the greater will be its sphere of action. The annual subscription, it may be observed, is only 5s. per annum, which covers payment for a copy of the monthly organ of the Association, the *Municipal Officers' Journal*, and the only qualifications for membership are that candidates must be officers duly elected by a statutory Local Government Authority. The president of the Association for the current year is Mr. G. Laurence Gomme, the Clerk of the London County Council, and the secretary is Mr. Frank G. Beeching, 117, Holborn, London, E.C.

The Royal Institute of Public Health, who are holding their annual Congress at Eastbourne from July 25th to 30th, have issued their provisional programme, and a most interesting one it is. Members and delegates will find that ample provision has been made for their enjoyment in the way of receptions, garden parties, excursions, concerts, and balls. It has been hinted that these Congresses of the Institute of Public Health are more renowned as sources of conviviality and gaiety than for the business which is transacted there, and it is to be hoped that on this occasion more genuine interest will be taken in the papers and discussions than has been the case in recent years.

There will be, as usual, a Municipal Engineering Section at the Congress. Somehow in the past Municipal Engineers have held aloof from active participation with the work of this Institute, the opinion being generally held that these Congresses were run by and for the medical profession. Mr. Chas. H. Lowe, M. Inst. C.E., is to be the president of the Engineers' Congress. Applications are being sent out to Municipal Engineers by the hon. secretaries for the contribution of papers. By the way, the literary character of this circular is not such an example of English as is to be commended. "It is requested," so the application reads, "that papers should, if possible, be sent in to the undersigned not later than July 1st next, or if this is not possible, the title of the paper;" and "papers should take a maximum of from fifteen to twenty minutes to read, although in special cases this would be no fixed rule." Possibly the person who drafted this circular knows what he intended to convey. It is doubtful whether most readers will.

One comes across many so-called "experts" in connection with the various phases of municipal engineering, but I venture to believe that the particular individual, whose report appears in this week's issue, who for evident reasons prepared a report on certain sewage disposal systems without being commissioned by any authority, or person or persons to do so, and, forthwith, secures its insertion in a provincial paper, circulating in a town where a system—opposed to that in which he is, I conjecture, interested—is being promulgated by the Local Authority, is, I am bound to say from a wide knowledge of the idiosyncrasies of this type of "expert," an expert in the art of pushing of his own nostrums.

Now one has a genuine regard for any patentees or firms who push the sale of their own specialities in genuine British fashion, but when these abuse the privilege of the Press, to anonymously attack other systems—as one only too frequently sees it in provincial papers—a community is juggled and blinded, and the difficulties of Local Authorities are increased, whilst huge sums of money are too often wasted through improper schemes being foisted upon a district by individuals who work upon the ignorance of representatives and ratepayers.

I venture to think that neither an engineer nor a chemist of any repute, whether he style himself an "expert" or not, would risk his reputation by contributing such a communication as the one in question to this or any other professional journal of standing over his own name. The *bonâ fides* of this "expert" are, of course, valueless. That sewage can be efficiently purified, and practically without sludge, by any one of the numerous systems of bacterial and biological treatment, no intelligent engineer or chemist will venture to deny. It is a matter for serious condemnation that most of the sewage works which have been designed within the last four years have been converted into bacterial and biological systems, whilst the costly machinery for the pressing of sludge now represents wasted money, and can only be disposed of as scrap iron.

Briefly, the assertions of the "Expert" in question are as follows:—(1) The result of experiments conducted at London, Leicester, Leeds, and Manchester, to test the efficiency of the bacterial system of sewage purification, has been completely falsified. (2) The theory of the system is not admitted by the officials of the Local Government Board to be practicable. (3) That filters are completely choked in one and a-half years, even with a domestic sewage like that of London. (4) That the double or multiple contact-bed system "*without previous tanks*, is regarded as *dead*."

Now I have no hesitation in observing that these assertions are in every case *absolutely untrue*. I have frequently pointed out in these columns that no engineer or chemist is justified in dogmatising as to the treatment of sewage, and saying that any one system is applicable to the purification of the sewage of all towns and places, and I am convinced that no system has yet been discovered which can be guaranteed to

answer such conditions. On the other hand, there is no justification for any individual who, to further the adoption of a system to which he is "wedded" for particular reasons, publishes statements regarding a competing system or systems which as in this case are entirely at variance with fact. This line of conduct may temporarily mislead, as such a letter is doubtless intended to mislead, the readers of provincial papers where it appears, when a sewage scheme is being propounded in a district, but to impartial-minded engineers and chemists such men are not "experts," but belong to the class known as "charlatans." Perhaps "Expert" will be good enough to give his views in the columns of this journal and controvert me. They will be, I doubt not, welcome. SENEX.

LADY SANITARY INSPECTORS.

AMUSING DISCUSSION AT DUNDEE.

SHOULD Sanitary Inspectors of the gentler sex be known as "Lady Sanitary Inspectors," "Female Family Advisers," or "Women Inspectors?" These were questions considered at the last monthly meeting of the Dundee Town Council.

The discussion took place on the recommendation of the Sanitary Committee that the appointment of two lady Sanitary Inspectors should be delayed.

Councillor ELLIOTT supported the Committee's suggestion on the ground that there were so many changes going on, or about due, in the Sanitary Department; it was the most advisable course to let the matter lie over. Once they had everything in order they wanted, they could consider the proposal.

Treasurer RITCHIE championed the cause of the lady Inspectors, and moved the Committee be instructed to take up the question at once. Wherever lady Inspectors had been appointed they had, he said, been of great value.

Bailie BARRIE seconded, on the grounds that the "health is the wealth" of the town.

Mr. ELLIOTT then moved the approval of the minute.

Bailie CRICHTON, and Mr. DOIG were of opinion that the Inspectors would do a vast amount of good in teaching poor people to keep their houses clean. They would, too, instruct mothers how to feed their children, which in Dundee, with its high infantile mortality, was a great consideration.

Mr. HENDERSON pointed out that in other towns the female inspectors were known by the title of "female family advisers," because the chief part of their duties was to visit poor homes and instruct mothers in cleanliness and in the upbringing of children.

Mr. JOHN ROBERTSON was in great form over the threatened appointment. What good, he asked, would the citizens receive from two women gossiping from door to door, which would be the chief part of their occupation? Were they going to pay these inspectors to teach mothers how to feed their children, was it to be part of their work to clothe the naked? He was afraid that if the Inspectors went into a house to instruct a woman how to wash the floor, they would soon find themselves at the bottom of the stair. (Laughter.) If they wanted female Inspectors, they must have a female department. It simply meant a reorganisation of the whole sanitary staff.

Notwithstanding Mr. Robertson's forcible illustration, the Council resolved, by fourteen votes to twelve, to instruct the Sanitary Committee to at once report on the appointment of "lady Sanitary Inspectors," or "female family advisers."

Public Works.

SEWERAGE.

AT a recent meeting of the Rhymney District Council tenders were accepted in connection with the sewerage scheme, and it is hoped to commence the work in a fortnight.

THE North Darley Urban District Council has instructed Mr. Harry W. Taylor, A.M.I.C.E., of Newcastle-on-Tyne and Birmingham, to prepare a scheme of sewerage and sewage disposal for its district.

THE Streets Committee of the Walsall Town Council recommends that a 24in. main outfall sewer be constructed through the Arboretum, from Buchanan-road to Lichfield-street, at an estimated cost of £1000, and that application be made to the Local Government Board for sanction to a loan to defray the cost of the work.

THE Nuneaton and Chilvers Coton Urban District Council has given an order for a Meldrum Simplex destructor to be erected at the sewage works, to supply all power for pumping, &c. Similar plant has been working at the Hereford sewage works for four years, resulting in a saving of from £400 to £500 per annum.

MR. R. H. BICKNELL, an Inspector of the Local Government Board, has just held an inquiry into the application of the Castle Ward Rural District Council to borrow £2000 for works of sewerage and sewage disposal for Dinnington Colliery. The sewage will gravitate to the outfall and be disposed of bacterially. Mr. Harry W. Taylor, A.M.I.C.E, of Newcastle-on-Tyne and Birmingham, is the engineer. There was no opposition.

THE Local Government Board has refused the application of the Branksome Council for leave to borrow money for the sewerage scheme—a scheme which, it will be remembered, proposed to deal with the sewerage of part of the district on the "septic tank" system, and to discharge the effluent into the Bourne Brook. The Bournemouth Corporation opposed on the ground that, even if the effluent were absolutely pure and innocuous, there were strong sentimental objection to sending it through the Pleasure Gardens intersecting the centre of a popular health resort. The Branksome Council has still to face the problem of how to meet the sanitary requirements of a part of its district, which is exceptionally difficult to deal with.

THE lease of a sewage farm of the Wolstanton Rural District Council having expired, negotiations have been going on for the purchase of the same, and the question of price was referred to arbitration. Consequently an arbitration was held at the North Stafford Hotel, Stoke, last Thursday, to fix the price. Mr. Frederick Fowler (Sheffield) sat as umpire, with two arbitrators. Mr. Freeman, for the owners, pointed out that the land had a special value as accommodation land and a remote value as building land. The total value of the minerals —including some lesser seams—with 10 per cent. added for compulsory purchase he put at £27,196. This with the surface value made a total of £41,400 for the site of the sewage farm. He asked Mr. Udall if he would negotiate on the basis of the Local Authority, merely purchasing the surface rights. Eventually it was agreed that the surface price of the land should be £10,000—subject to the confirmation of the Council—the Council to pay £520 for the cost of the arbitration, agreement, action, conveyance, and umpire's, arbitrators', and counsel's fees. The Council to pay its own costs and counsel's fees and witnesses. The arbitration stood adjourned that the arbitrators might give a formal award when the Council shall have sanctioned the purchase.

A Local Government Board inquiry has been held at Littleborough with reference to the application of the Urban District Council for sanction to the borrowing of £13,400 for works of private street improvements, and £1440 for works of sewerage, and £375 for the diversion and covering of a watercourse.

It has been recognised for a long time, says the *Lancet*, that a main sewer to deal with a portion of the sewage in the lower part of Swansea is urgently needed, and various schemes have from time to time been discussed by the Corporation. These have at length been focussed into three definite proposals, in one of which the outfall is in the town at the pier-head and in the other two at Brynmill, a short distance from the more densely-populated portion of the town but quite close to the sands and promenade. The outfall at the pier-head and in one of the Brynmill schemes discharges the sewage into the sea untreated, but in the alternative Brynmill scheme it is proposed to provide for a septic tank between the termination of the sewer and its outfall, though the effluent is not to be subjected to any filtering process or to be made to pass over land. The members of the Town Council have been very evenly divided in their opinions as to the merits of these three projects, the cost of which does not vary more than a few thousand pounds, for the engineer's estimate in each case is between £70,000 and £80,000. In spite of the advice of its responsible officers, the Town Council has decided by twenty votes to eleven to carry the sewer to Brynmill and to discharge the sewage after it has passed through a septic tank on to the sands at low water. There still remains the Engineering Inspector of the Local Government Board to be reckoned with, and hitherto the policy of the Board has been to require provision to be made for the treatment of the effluent from a septic tank before sanctioning expenditure upon works of this nature, though it is possible that there may be in the local conditions at Swansea circumstances warranting a departure from this policy.

At the last monthly meeting of the Sowerby Bridge District Council, the question of the new sewage scheme was brought forward. The Local Government Board wrote to the effect that it was not prepared to sanction the proposed works of sewage disposal, as it was advised that they were inadequate to meet the requirements of the case. The usual requirements in such cases were (1) that the water-holding capacity of the coarse and also the fine beds when matured should be equal to one day's dry weather flow; (2) that the sewage, after passing through both coarse and fine beds, should be subjected to further treatment on an area of suitable land in the proportion of not less than one acre to every thousand persons draining to the outfall; (3) that provision should be made in the scheme for dealing with excess liquid beyond three times, but not exceeding six times, the dry weather flow, either by distributing it on a special area of land prepared for the purpose, or by passing it through separate storm-water filters of sufficient extent to admit of a rate of filtration not exceeding 500 gallons per square yard per diem. The Board further required the Council to ascertain approximately, if not exactly, the volume of the dry-weather flow from the parts of Sowerby and Norland which would be drained into their sewage system. The engineer was instructed to again make observations with a view to ascertaining the dry-weather flow. The Sowerby District Council stated that approximately the dry-weather flow from its part of the district would be 70,000 gallons per day. It was decided not to alter the original scheme by taking in trade effluents. The Clerk was instructed to write to the Town Clerk of Halifax, pointing out that a considerable amount of sewage was going into the Sowerby Bridge district from Cote Hill and Bairstow, and requesting the Corporation to take steps to abate it.

Last week a Local Government Board inquiry was held at Alvaston, near Derby, in reference to an application from the Urban Council to borrow £12,000 for a scheme of sewerage. Mr. Stone, of Derby, supported the application, whilst Mr. Bostock opposed it on behalf of several members of the Council. The inquiry was protracted.

A scheme of main sewerage and sewage disposal prepared by Messrs. D. Balfour and Son of London, and Newcastle-on-Tyne, has been approved for Wiseton, Doncaster, and an immediate start is to be made with the work. The method of sewage disposal consists in the treatment in self-acting bacterial tanks, the effluent from which will discharge into the adjoining watercourse.

As the result of the recent extension of the Ripon city boundaries the Corporation made application at a Local Government Board inquiry held last week before Mr. W. O. E. Meade King, for sanction to borrow £5000 for purposes of sewerage and sewage disposal, and £3000 for carrying out certain street improvements. It appeared from the statement made by the Town Clerk (Mr. M. Kirkley) that the three portions added to the city through the extension contained 210 acres, and were at present unprovided with sewerage or sewage disposal works The population of Ripon in 1891 was 7512, and according to figures which he had received from the Census-office, which were subject to revision, in 1901 the population was 8225. This was a total increase for the whole city of 713; but of these 343 were brought in through the extension, the increase in the added part of the city being 89, and in the city before the extension 281. The city was assessed at £32,552 for district rate purposes, and the outstanding debt under Public Health Acts was £30,531. There was no opposition, and the proceedings closed with a vote of thanks to the Inspector.

WATER.

Mr. H. P. Boulnois, C.E., held an inquiry on behalf of the Local Government Board at Bagillt last week with reference to the application of the Holywell Rural District Council for sanction to borrow the sum of £2500 for purposes of water supply in the Bagillt special drainage district.

At last week's meeting of the Otley District Council an account for £1450 was passed to be paid to Mr. M. D'Wyvill, Denton Park, for easements for three miles of water mains through his land. The question of compensation has been in the hands of Mr. Straughan, C.E., on behalf of the Otley District Council, and Mr. Routh, C.E., acting for Mr. Wyvill, who referred the matter to Mr. Crowther, C.E,, as umpire. The price was considered by the Council to be satisfactory.

At last week's meeting of the Waterworks Committee of the Manchester Corporation, the fourth and final contract was let for the supply of iron pipes for the second pipe from Thirlmere to Manchester. The contract is for the supply of 15,750 tons of castings, which are to be placed between Grasmere and a point near Kendal. The total weight of metal included in the four contracts is 62,700 tons, and the price, it is estimated, will be about £314,000. When the consent of the City Council to the laying of the second pipe was given, a year or so ago, the price of iron was high as compared with the present market rate. It is calculated that by waiting, and thus having advantage of the drops in the iron market, the Committee have placed their orders in such a way as to effect a saving of nearly £80,000, a fact upon which the members congratulate themselves. The reckoning is based on prices which they had to pay for some urgently necessary pipes for the Longdendale works whilst high values prevailed. No contracts for laying the Thirlmere pipes have yet been entered into.

The Ilkeston and Heanor Water Board Bill came last week before the House of Lords' examiner for proof of compliance with Standing Orders. The objects of the Bill are to constitute a joint board representative of the Corporation of Ilkeston and the Heanor Urban District Council, with power to acquire the undertaking of the Meerbrook Sough Company, and to construct works for intercepting and distributing the waters of the Meerbrook Sough, and for other purposes. The Standing Orders having been found duly complied with, the Bill will be reported for second reading.

At a recent meeting of the Llanelly Waterworks Committee the chairman (Mr. Ernest Trubshaw) reported excellent progress with the new reservoir which Mr. L. P. Nott is constructing at Upper Lliedi. This will have a storage capacity of 200 million gallons, and with the existing reservoir at Cwmlliedi holding 220 million gallons, will place the town in possession of a magnificent water supply. Mr. Trubshaw remarked that the cost of the works would be well within the amount borrowed, and, in all probability, when the contract was completed, they would have £4000 or even more in hand. It had been decided to pitch the sides of the new reservoir.

The scheme for augmenting the water supply of the city of St. Andrews, which was commenced two years ago, has now been completed. Prior to this year there was only storage capacity for a reserve of water to tide over a dry season of three million gallons, but a new reservoir has been constructed in Langraw Den, which will augment the storage water to seventeen million gallons, and it is calculated that there is now amply sufficient along with the dry weather flow of the various streams, to provide forty gallons per head of the population daily throughout the whole of the summer months. New filters have also been built at an elevation of 70ft. higher than the filters previously in use, and this will give a much needed additional pressure to the higher parts of the city. The engineers were Messrs. Belfrage and Carfrae, Edinburgh.

The building of a new reservoir contiguous to the present reservoir at Littledenny, and the extension of the Faughlan reservoir at Carron Bridge, Denny, at an estimated expenditure of about £100,000, was begun last week at Windyedge and Drumbowie, the site of the new reservoir. There was no elaborate function at the cutting of the first sod. Mr. Copland, Glasgow, is engineer to the trust, and Mr. John Best, Edinburgh, is contractor. The start was made in the presence of Mr. Pirrie, representative of the engineer; Mr. Finlay Best, Mr. Shand, C.E., for the contractors; Mr. Main, Mr. Wm. Murray, manager, for the contractors; and Mr. Massie, superintendent of Falkirk and Larbert Trust. The cutting of the first sod was entrusted to Mr. Pirrie, who performed the ceremony amid cheers, wishing success to the undertaking. The whole work is to be completed in two years.

At the last monthly meeting of the Richmond Rural Council, Mr. Dent referring to the Newsham water supply, said they did not agree to the scheme suggested by the Local Government Board, and were in favour of abandoning it altogether. Mr. S. Johnson objected to such a course being taken, and pointed out that a large sum of money had already been spent in preparing plans, &c., and if it was abandoned these expenses would have to be paid by the whole of the district. In view of this work, it was thought advisable for some of the outside farmers to be elected on the Newsham Parochial Committee, and Messrs. Glover and Shippon were accordingly elected. A letter was read from Newsham stating that at a special meeting of the ratepayers the water supply question was discussed, and the sinking of two wells, the erection of two pumps, and boring for water at the top of the hill were suggested. It was decided to try the last-named suggestion.

The Corporation of Accrington has resolved to spend a further £9000 in electric mains and other electric lighting works, and £1000 for the acquisition of a site for baths and washhouses.

The members of the Lancaster Corporation paid their annual visit of inspection to the waterworks in the Wyresdale district last week. The new reservoir at Blea Tarn has just been completed, and will be formally "tapped" shortly. The sum spent on its construction is £50,000, £10,000 less than borrowing powers were obtained for. The capacity of the reservoir is 120,000,000 gallons.

LIGHTING.

The Wigton Urban District Council contemplates buying the gasworks of that town, the property of the Wigton Gas Company, Limited.

The tender of Messrs. R. F. Hislop, at £1232, for the construction of a regenerative retort bench at the Clacton Gasworks, has been accepted by the Urban Council.

A Local Government Board inquiry has been held at Bangor regarding the application of the Urban Council for a loan of £4169 for the purpose of carrying out gas extension works.

The work in connection with the installation of the electric light at Ambleside, which has been so long delayed, is now being vigorously pushed forward, and the main thoroughfare is now the scene of active operations. Where connection has been made and the lights tested it has been found highly satisfactory.

At the last monthly meeting of the Chorley Town Council, the Town Clerk submitted a letter from the Local Government Board sanctioning a loan of £21,300 for electric lighting purposes. It was resolved to interview the Lancashire Electric Power Company, and, if possible, obtain terms for a supply of electricity in bulk.

The Shoreditch Borough Council has decided upon expending a further £10,000 in extending its electric lighting mains, and has also put the official seal to an agreement to purchase certain freeholds in the neighbourhood of Haggerston Station, North London Railway, for the erection of municipal dwellings. The agreed price is £24,000.

During the seventeen years the Coventry gasworks have been in the hands of the Corporation there has each year, with only one or two exceptions, been a considerable sum of money handed over in reduction of rates; but the accounts for the past twelve months state that while the working profit was £9955, the final profit is only £329, which is recommended to be carried forward to the next account.

The directors of the Enfield Gas Company are offering for sale £5000 of Consolidated Ordinary Stock of the company. There are but very few gas companies, we believe, which have the power to offer new issues of capital, to other than the existing proprietors, at a fixed price. The South Metropolitan Gas Company is one of the exceptions, and the Enfield company another. Both obtained, on their own initiative, powers from Parliament to give the consumers of their gas a preferential standing in this respect; and to our thinking it is a wise as well as equitable arrangement to place the consumers in a better position in regard to the issue than the Stock Exchange or the man from New York. We imagine the consumers in Enfield will appreciate this consideration as much as those in South London have done, in which case applicants for allotments will doubtless have to be content with a considerably smaller amount of stock than they apply for.

The Alfreton Gas Bill has been read a third time in the House of Commons.

Last Friday afternoon Colonel Crawford, J.P., chairman of the Walker and Wallsend Union Gas Company, opened the valve which connects the works with the new Gadd and Mason gasholder, which has just been completed. The structure has a capacity of 300,000 cubic feet, and the work has been carried out in the remarkably short space of three months by Mr. D. M. Brims, of Newcastle, and by Messrs. R. and J. Dempster, Limited, of Manchester.

At the last monthly meeting of Linlithgow Town Council, a communication was read from Messrs. Crompton and Co., electrical engineers, London, inquiring what had been done by the Council in regard to their offer to introduce the electric light to their town, and offering to apply for a Provisional Order in their own name. The letter was remitted to the Lighting Committee, which is to submit a report of the whole question to an early meeting of the Town Council.

At a meeting of Dumfries Town Council last week the Electric Light Committee reported that it had found it impracticable to proceed with the scheme of utilising water power for generation of electric lighting according to the report of Mr. Ritchie, electrical engineer. It was agreed that the Clerk should communicate with Dr. Mond on the subject of the suitability of the new Mond gas for street lighting, and write to the Board of Trade explaining the Council's position in regard to the Provisional Order, and asking an extension of time in order to carry it out.

The Board of Trade has granted a Provisional Order for the electric lighting of Whitley and Monkseaton. The area of supply is to comprise the whole of the urban district of Whitley and Monkseaton, but it is expressly provided that the powers granted by this Order shall not be exercised unless they are transferred to a limited company, approved by the Board of Trade for the purpose. Power is given to the Local Authority to purchase the undertaking after the expiration of a period of ten years "upon the terms of paying to the undertakers the fair market value of the undertaking as a going concern, that value to be determined in default of agreement by arbitration."

At last week's meeting of the City Council at Hereford it was reported that the electric lighting profit for the first year was sufficient not only to pay the interest, but also to almost discharge the first instalment of capital, £800. This was considered highly satisfactory, the amount to be borne by the rates being only £85. It was decided to increase the electrical engineer's salary to £200. The Gas Committee, in asking for £4000 more to install additional penny-in-the-slot meters, pointed out that there was not only a profit of £87 19s. 8d. on the 1174 slot meters already installed at a cost of £5442 12s. 8d., but it had saved the Committee raising the price to ordinary consumers, and when the loan on the gasworks was paid off next July they hoped to sell gas at 2s. 6d. per 1000 feet.

GENERAL.

The Local Government Board has sanctioned the borrowing by the Chorley Town Council of £7645 for a refuse destructor.

The Edmonton Urban District Council proposes spending £27,000 in erecting workmen's houses on the Brookfield Estate, Edmonton.

We understand that the City Councils of Sheffield and Edinburgh have both decided to do something to check the spread of consumption. The former intends to try and cure consumptive patients in the earlier stages of the disease, while the latter has decided to provide a retreat for hopeless cases.

At a recent meeting of the Northallerton Town Council, it was decided to obtain the sanction of the Local Government Board for a loan of £3000 for making new roads.

At last week's meeting of the Monmouth Town Council a letter was read from the Local Government Board, granting authority for a loan of £16,952 for public improvements.

The Rochdale Health Committee has resolved that 15,000 handbills be printed and distributed throughout the borough, stating the precautions to be taken against summer diarrhœa, scarlet fever, &c.

A Local Government Board inquiry was held last Friday at Ilford, by Col. Von Donop, R.E., into the application of the Urban District Council for sanction to borrow £106,737 for the construction of tramways and plant.

The Health Committee of the Darwen Town Council has decided to make an application to the Local Government Board to hold an inquiry into the epidemic of diphtheria which has been prevalent in the town for the last six months.

A Local Government Board inquiry has been held by Col. A. C. Smith, R.E., at Ryde, Isle of Wight, with reference to the application of the Town Council for sanction to borrow £600 for the purchase of horses, harness, and dust carts for scavenging purposes.

An inquiry has been held at Warrington by Mr. Manby, M.D., Local Government Board Inspector, into an application of the Corporation for sanction to borrow £9979 for the provision of a small-pox hospital at Great Sankey, and £8702 for the extension of the Borough Infectious Disease Hospital.

A Local Government Board inquiry was held last week at Broadstairs by Mr. H. H. Law, M.I.C.E., into the applications of the Broadstairs and St. Peter's Urban District Councils for sanction to borrow £4370 for works of sewerage, £1850 for purposes of street improvement, and £1710 for purposes of public walks and pleasure grounds.

At the monthly meeting of the Bromley and Beckenham Joint Hospital Board, it was decided to accept the tender of Messrs. William Smith and Son, of Croydon, amounting to £5998 10s., for the erection of new diphtheria wards at the Bromley Common Hospital, and to negotiate with the Public Works Loan Commissioners for the raising of the necessary loan.

At the last meeting of the Llangollen Urban Council, the Clerk read a letter from the Local Government Board stating that, in view of grave representations made to them by Mr. George Saint, a member of the Council, it must delay authorising the loan for improvements to the local Smithfield. The Board forwarded Mr. Saint's letter to the Council, and asked for an explanation as to its contents. The enclosure, which was read amid sensation and loud expressions of disapproval, asserts *inter alia* that the death-rate of the town—17·05 per thousand—shows the place to be in an unhealthy state, which Mr. Saint attributes to bad drainage. He considers the town, from its position, should be quite a sanatorium, and that the death-rate should not exceed 12 or 13 per thousand if the drainage were properly seen to by the Authorities. He suggested that the Local Government Board should send an Inspector down to make a house-to-house inspection of the district, and urges it not to sanction the raising of loans for purposes of market improvement, electric lighting, or to make the Town Hall secure until the drainage is set right. A heated discussion followed the reading of this letter. The Medical Officer said the charges made were groundless, and eventually it was agreed to send a letter to the Local Government Board to that effect.

Lord Lister will open the new operating theatres and children's ward at St. Thomas's Hospital on June 20th at four p.m. The theatres have been fitted with all the latest improvements for the carrying out of aseptic surgery, and the new block of buildings is provided with an artificial system of ventilation. The children's ward is elaborately decorated with pictorial representations of fairy tales and nursery rhymes in tiles, the cost being defrayed by one of the governors of the hospital.

With reference to some remarks reported to have been made by Councillor Bayley Marshall respecting the ownership of some alleged slum dwellings in Birmingham, the following letter has been received by Alderman Cook, in which it will be seen that Mr. Bayley Marshall expresses his regret that he spoke under a misapprehension of the circumstances:—"Richmond Hill, Birmingham, 31st May, 1901. Dear Alderman Cook,—I do not wonder that you should have felt aggrieved at the remarks made by me at the recent meeting of the Liberal Unionists in St. Bartholomew's Ward. I was certainly induced to believe (with many others) from statements which appeared in the *Gazette* newspaper, that you had an interest in slum property in Birmingham, and that the ownership of such property had induced you to abstain from the proper performance of your duties as chairman of the Health Committee. It would have been wiser on my part to have made inquiries from you before assuming the correctness of the insinuations made by the *Gazette*, and for this omission I tender you my hearty apology. I find on inquiry that you do not own and never have owned any slum property at all.—Yours faithfully, W. Bayley Marshall. P.S.—You are quite at liberty to publish this letter." In publishing Mr. Bayley Marshall's letter, the *Daily Gazette* emphatically denied that anything published in that journal justified any person in saying that it charged Mr. Cook with being an owner of slum property.

We extract the following from the *North British Daily Mail*:—"A special adjourned meeting of the Moffat Town Council was held on Tuesday evening—Provost Kennedy presiding—to consider the applications for the post of Sanitary Inspector and Burgh Surveyor, now vacant. There were over thirty applicants, including Bailie Easton, one of the magistrates of the burgh. Mr. Hamilton moved that Mr. John Fyfe, plumber, Paisley, be appointed. Mr. Johnstone seconded. Bailie Richardson nominated Mr. Easton, which was seconded by Mr. Steven. The applications and testimonials of the two candidates were asked to be read, and it was pointed out that Mr. Easton did not fulfil the requirements, inasmuch that he was not a plumber, and also that he had failed to produce three testimonials, as requested. Some vigorous discussion took place regarding the competency of appointing anyone not a plumber, in view of a former resolution of the Council, and on the legality of allowing Mr. Easton, if appointed, to pay the plumber work out of his pocket, as he proposed doing. The Chairman and Bailie Richardson advocated strongly the cause of their ex-colleague in the magistracy. On a division, Mr. Easton was elected by the casting vote of the Chairman, there being an equality of four votes, as in previous divisions. Mr. Johnstone, who characterised the finding of the meeting as 'a grave prostitution of the public interests,' formally entered his dissent, the other three members in the minority doing likewise. Mr. Easton is a clogmaker by trade." The action of the Council is one of the most discreditable performances we have yet recorded. The previous meeting was adjourned in order to let Mr. Easton retire from the Council. His application should never have been entertained, as he did not come up to the Council's own requirements. The whole thing is a job, and cannot be otherwise described.

The Health Committee of the Bradford Corporation has had under consideration a scheme for dealing with the Longlands insanitary area, concerning which it has been for some time pressed by the Local Government Board. The scheme is one drafted by the city architect, and will, if carried out, involve an expenditure of £60,000. The scheme provides for the housing of 840 people on the same spot, and the Committee adopted it after modifying it in some minor details. The Committee also decided to inspect certain land on the outskirts of the city with a view to accommodating some of the people away from the congested area.

Mr. W. O. E. Meade King, an Inspector of the Local Government Board, held an inquiry at Ripon on Thursday with respect to the application of the City Council for leave to borrow £5000 for works of sewerage and sewage disposal, and £3000 for purposes of street improvement. The City Surveyor (Mr. W. Edson) stated that the Corporation had 13 acres of land laid out at present for sewage disposal purposes, and it was intended to lay out another area of eight acres. The street improvements contemplated mainly consisted in widening and rounding off corners. The total amount of land required was 5580 square yards, for which provisional agreements had been made. There was no opposition to the application.

The fifty-seventh annual report of the Metropolitan Association for Improving the Dwellings of the Industrious Classes shows an increase of £226 13s. 6d. in the receipts from the gross rents, the amount received being £25,953 7s. 3d. as compared with £25,726 13s. 9d. in the previous year. The sanitary improvement of Farringdon-road-buildings, the largest of the properties belonging to the association, has been commenced, it is stated, one out of the five blocks having been dealt with during the year. New sanitary appliances have been provided throughout, and certain windows have been enlarged, while new ones have been added to increase the amount of light and air. A portion of the cost—£520 2s.—has been charged to the capital account of the building, while the balance—£1,330 15s. 5d.—has been paid out of revenue. Improvements in other properties are also reported. Out of an available balance of £8805 5s. 1d. the directors propose to pay a dividend at the rate of 4½ per cent. per annum on the ordinary consolidated stock, leaving £156 5s. 1d. to be carried forward.

At the recent meeting of the Public Health Committee of Derry Corporation, Dr. Ferguson, Medical Superintendent Officer of Health, submitted some remarks upon the report of Dr. C. Bigger, the Local Government Board Inspector, regarding the unsanitary condition of the city. Dr. Ferguson suggested an inspection of individual unsanitary houses and the remedying of the defects, but preferably putting the provisions of the Housing of the Working Classes Act into force, where the whole unsanitary areas could be cleared and suitable breathing spaces provided in congested districts. He admitted the great expense of the latter plan, but believed it would eventually pay in cash and the improved health of the poor and rich alike, "as zymotic disease," says Dr. Ferguson, "is no respecter of full purses more than empty ones." He advocated the establishment of manure depôts, and suggested utilising the present disfiguring foreshore between the shipyard and the Narrows. He adds—"Piggeries are a great source of nuisance in the borough, and permission to keep pigs should be restricted." In regard to the water supply, he says the Corporation can give a constant supply, having storage capacity in the reservoirs. There must be waste somewhere, which requires immediate attention. In conclusion, he admits there is no system of filtration, but as an analysis of the water is fair, it is not necessary at present to go to the expense of making filter beds.

At a meeting of the Parliamentary Committee of the Leeds Corporation last week, a short discussion took place on a proposal which is before the public for constructing a line of light railway between Wakefield and Leeds. The line, if sanctioned by the Commissioners, would enter the Leeds city boundary for a few yards, and the Committee decided to advise the Council to oppose the project.

On Monday night there was a unique conversazione at the Guildhall, when the Corporation of London welcomed a section of the Mayors and members of the metropolitan Borough Councils. The capacity of the Guildhall will only accommodate some 2000 guests with comfort, hence the necessity for determining previously by ballot those municipalities who should be entertained first. They prove to be the City of Westminster, Battersea, Chelsea, Deptford, Finsbury, Greenwich, Hackney, Hammersmith, Holborn, Islington, Lewisham, St. Pancras, Shoreditch, Southwark, and Stepney. The remaining thirteen Borough Councils were received on Tuesday night, when precisely the same programme was gone through. In addition to the officers of the several metropoliton boroughs, invitations were issued to the members of the present and late Cabinet, the Lord Chief Justice (who was present), the metropolitan M.P.'s, the Livery Companies, the chairman and deputy-chairman of the London County Council, &c. The guests were received by the Lord Mayor and Lady Mayoress. The band of H.M. Grenadier Guards performed a programme of music, in the Council Chamber there was vocal and instrumental music, an entertainment was given by the Lawler Quintette, and dancing took place in the library. On each evening the Lord Mayor, Alderman Frank Green, spoke from the rostrum, welcoming most cordially the representatives of the new metropolitan boroughs.

PERSONAL.

Mr. Arthur Kent, of Hanley, has been appointed Sanitary Inspector for Stourbridge.

Mr. John Yorke has been appointed Inspector of Nuisances for Brierley Hill, at a salary of £80 per annum.

Mr. W. J. Bevan, of Longton, has been appointed manager of the Coventry Sewage Farm, at a salary of £250 per annum.

The Local Government Board has sanctioned the application of Dr. Swenden as Medical Officer for the rural district of Croft.

Mr. L. Rawlinson, deputy town clerk of St. Helens, has been chosen as town clerk for Leamington, at a salary of £400 per annum.

Miss Bentham, of Spennymoor, has been appointed Sanitary Inspector for Middlesbrough, at a salary of £78 per annum and uniform.

Mr. J. Franklin, of Stockport, has been appointed Inspector of Nuisances for the east district of Stockton rural district, at a gross salary of £130 per annum.

The Local Government Board has approved the appointment of Mr. Mills as Sanitary Inspector, and Dr. W. M. Clendennin as Medical Officer for Coseley.

Mr. J. H. Cawthra, the borough electrical engineer at Swansea, has been selected one of three candidates for the post of electrical engineer at the municipal station at South Shields.

Mr. Ernest H. L. Dickson, who for the past five and a-half years has occupied a position as assistant engineer at the Cheltenham Corporation Electricity Works, has just ceased that connection on his appointment to a more lucrative post at Salford.

Mr. B. W. Baillie has been re-appointed Sanitary Inspector for Northfleet.

Dr. P. R. Lewis has been appointed Medical Officer at the Bromyard Workhouse.

Dr. Groves has been re-appointed Medical Officer of Health for Woodford urban district for three years.

The Local Government Board has sanctioned the re-appointment of Mr. Alfred Flint as Inspector of Nuisances for the urban district of Bexhill at a salary of £140 per annum.

Mr. J. P. Evans, Beeston, Nottingham, has been appointed surveyor to the Kiveton Park Rural District Council. The appointment is worth £200 a year, with house, coals, and gas.

On Monday last the Leamington Town Council appointed as Town Clerk of the borough Mr. Leonard Rawlinson, Deputy Town Clerk of the county borough of St. Helens. The salary is £400 per annum with the services of a paid assistant.

Dr. Logan Taylor, eldest son of Dr. M. H. Taylor, has been appointed assistant to Surgeon-Major Ross, who is well known by his writings on malarial fevers conveyed by mosquitoes. The expedition is to follow up Major Ross' discoveries, and try, by destroying on a large scale the breeding places of that particular mosquito, to improve the health of the West African Coast. The experiments are to be conducted first at Freetown, Sierra Leone. The expedition is being supplied by Glasgow and Liverpool merchants.

NOTES AND QUERIES.

Subscribers may obtain advice on matters appertaining to Public Health Law and Municipal and Sanitary Engineering. Letters should be addressed "Notes and Queries," The Sanitary Record, 5, Fetter-lane, London, E.C. If an answer be required immediately, a stamped addressed envelope must be enclosed

2231.—Sanitary Building Construction: Examinations by Various Bodies.—"A. M." writes:—"Can you give me any information as to examinations for gold medal for sanitary building construction, where and when held, fees, &c?"

Answer.—Examinations in building construction are conducted by the Science and Art Department in the month of May in various towns in the kingdom. Information on the subject may be obtained on application to the Secretary, Science and Art Department, South Kensington. A bronze medal (not gold) is awarded for a first-class pass in the honours stage. Examinations are also held in the same subject by the City and Guilds of London Institute, particulars of which will be found in the "Programme of Technological Examinations of the City and Guilds of London Institute for the Session 1900-1," price 1s. 2d. post free, obtainable from the office of this journal; and by the Worshipful Company of Carpenters, Carpenters' Hall, London Wall, London, for particulars of which the querist should write the Secretary.

2232.—Plans for New Dwellings: Erecting Houses After Disapproval of Plans.—"J. K. L." writes:—"Plans for four houses were submitted to this Council which were disapproved on the ground that the method of drainage was unsatisfactory, the drains being shown to discharge into a combined cesspool with no overflow on to land, and without land to dispose of contents. The cesspool, being close to a highway, is likely to become a nuisance. The Council required one cesspool for each house, as the responsibility of emptying rests with the occupiers. Since the plans were disapproved the building has been commenced, and the work has considerably advanced, although he has received notice to discontinue. I am informed that all my Council can do in the matter is to direct how the drainage shall be done. This is practically impossible, as the ground is insufficient and unsuitable for building purposes, as it rises about 20ft. at the point near the cesspool. I enclose copy of building bye-laws. Will you kindly advise what course can be taken in this case? Has the Council no case against a person proceeding to build before plans are approved?"

Answer.—If the plans were in conformity with the building bye-laws, and the disapproval was made solely on the grounds stated by the querist, the Local Authority will be unable to succeed in proceedings against the owner for a breach of the bye-laws. Sec. 158 of the Act of 1875 applies to the case wherein is enacted that "where work is commenced after notice of disapproval of plans, *and is not in conformity with any bye-law*, the

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Council may pull it down." But in this case it does not appear that the work is in contravention of the bye-laws, and the owner may proceed with the erection of the building so long as he does not contravene any bye-law. The Local Authority should ensure that all the provisions of the bye-laws are being carried out, and if the notices required by Clause 102 of the bye-laws relating to notices have not been observed proceedings may be taken against him. They may also strictly enforce the requirements of Clauses 67 to 74 of the bye-laws relating to drainage.

2233.—New Buildings; Open Space at Rear.—"Building" writes:—My Council have the Model Bye-laws of the Local Government Board in force with regard to the question of an open space at rear. A difference of opinion has arisen. The clause reads, "Every person who shall erect a new domestic building shall provide in the rear of such building an open space exclusively belonging to such building,' &c. The clause further states, 'If the height of such building be 15ft., he shall cause such distance to be 15ft. at the least. If the height of such building be 25ft. he shall cause such distance to be 20ft. at the least.' Does this in your opinion mean that if the height of a building be, say, 20ft., the air space shall be 15ft. or 20ft?"

Answer.—The proper interpretation to be placed upon the clause is that where the height of a building is over 15ft. and under 25ft. the distance across the open space (from the rearmost wall of any part of the building excepting a water-closet) must be 15ft.

2234.—Duties of Inspector of Nuisances.—"Inspector" writes:—"Will you kindly advise whether it is the duty of an Inspector of Nuisances to carry out the duties as in 1, 2, and 3, unless specially appointed to do so, viz.:—(1) Inspector of Factories and Workshops; (2) Inspector of Common Lodging-houses; (3) Inspector under the Dairies, Cowsheds, and Milk-shops Order. Further (4) Do the duties as above come within the Order of the Local Government Board of the 23rd March, 1891? (5) Can an Inspector of Nuisances be dismissed at the pleasure of the Council at the end of any year, when his appointment is an annual one, and subject to the approval of the Local Government Board? (6) What power have the Local Government Board over a Local Authority with regard to an Inspector of Nuisances? (7) Have the Local Government Board any control in respect to the amount of salary an Inspector of Nuisances shall be paid? (8) Where a Local Authority has divided the office of Surveyor and Inspector of Nuisances with the approval of the Local Government Board, would the Local Government Board allow the Local Authority to again combine the offices?"

Answer.—(1) Except in large populous boroughs where a separate Inspector may be appointed as Inspector of Workshops, an Inspector of Nuisances may, in our opinion, be required to perform the duties without being specially appointed to do so. (2) No special appointment is necessary; the Inspector of Nuisances is bound to perform the duties. (3) Such duties are prescribed within the terms of the General Order of the Local Government Board. (4) Yes. (5) Yes. (6) and (7) When a portion of the Inspector's salary is paid by the County Council the Local Government Board have power to veto any appointment of, and prescribe the salary which should be paid to, an Inspector of Nuisances. (8) If the offices of Surveyor and Inspector have been divided at the request of the Local Government Board, they would not, in our opinion, assent to the re-union of the said offices. The querist should refer to the General Order of the Local Government Board, which will be found in Himes' excellent "Practical Guide to the Public Health Acts," price 15s. net.

2235.—Sanitary Engineers' Examination: Books to Study.—"Constant Reader" writes:—"Please advise what books should be studied for the examination for Sanitary Engineers?"

Answer.—Reid's "Practical Sanitation," price 6s.; Jensen's "House Drainage and Sanitary Fitments," price 5s.; Jensen's "Modern Drainage Inspection and Sanitary Surveys," price 2s. 6d. are recommended.

2236. — Emptying Sewage into a Highway Drain.—"J. C. P." writes:—"The houses in my district are at present drained into cesspools, but in one part of the district two houses have their drains separately connected to a surface water drain, which is only intended for road drainage. A nuisance is caused by the accumulation of sewage in the ditch into which the drain discharges. In addition to the above there is also an overflow from a cesspool connected to the surface-water drain. There are two owners for the three houses, and they refuse to disconnect from the surface-water drain, contending that the surface-water drain receiving the drainage of more than one house is a sewer. Can the Local Authority compel the owner to disconnect the cesspool overflow from the surface-water drain, and also the other owner to disconnect his drains from the surface-water drain and from all cesspools?"

Answer.—We are of opinion that the Local Authority would not succeed in proceedings to require the disconnection of the drains from the pipe in question. It is the duty of the Authority to provide a sewerage system, and it would appear that they are endeavouring to shirk this obligation, and transfer it to individual owners. In Fordom *v.* Parsons (1894), 2 Q.B. 780; 58 J.P. 765, where the facts were similar to those mentioned by the querist, the Local Authority having instituted proceedings against the respondent for the abatement of a nuisance caused by a drain emptying into a ditch, the justices dismissed the complaint, and on appeal by the Local Authority judgment was given for the respondent.

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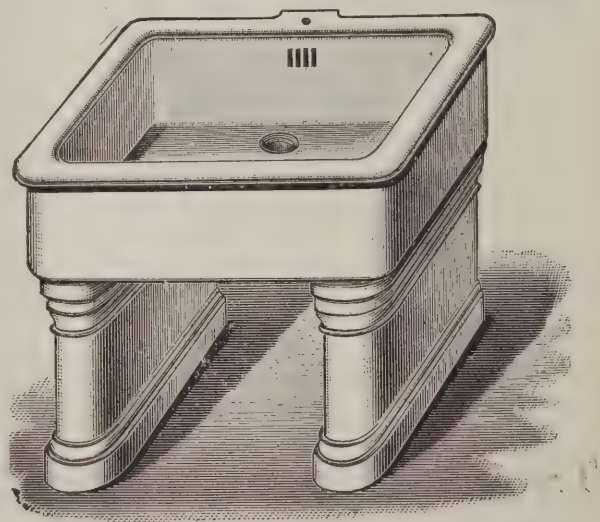

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THE CONSTRUCTION OF ROADS, PATHS, AND SEA DEFENCES.

By Frank Latham, C.E.

(Borough Engineer and Surveyor, Penzance. Author of "The Sanitation of Domestic Buildings," &c.)

(Continued from page 513.)

CHAPTER III.—LINE OF ROAD.

Bearing the question of gradients in mind, the next matter for consideration is the location of a road which would provide the shortest route for the main portion of the traffic.

In planning new roads it is often found necessary to deviate from a direct line, in order to meet certain existing roads or to provide for the traffic to some village, or owing to the desirability of taking a pleasanter route. So that it is seldom that a road can be laid out in such a direct line as could be desired, from an economic point of view.

Apart from these, there are other influences which are too often allowed to affect the line of a road, and these require a larger amount of serious attention than is generally given to them. These causes consist generally in the expense of constructing bridges over rivers, or of raising a road by means of embankments above low and flat lands subject to inundation during high floods.

Sir Henry Parnell remarks on this point, "The peculiar circumstances of a river may render it necessary to deviate from a direct line in laying out a road. A difficulty may arise from the breadth of the river requiring a bridge of extraordinary dimensions, or from the land for a considerable distance on the side of the river being subject to be covered with water to the depth of several feet in floods. In these cases it may appear, upon accurately calculating and balancing the relative inconvenience and expense of endeavouring to keep a straight line and of taking a circuitous route, that upon principles of security, convenience, and expense, the circuitous course will be the best.

"In general, rivers have been allowed to divert the direct line of a road too readily. There has been too much timidity about incurring the expense of new bridges, and about making embankments over flat land to raise the roads above the level of high floods.

"These apprehensions would frequently be laid aside if proper opinions were formed of the advantages that arise from making roads, in the first instance, in the shortest directions and in the most perfect manner. If a mile, half a mile, or even a quarter of a mile of road be saved by expending even several thousand pounds, the good done extends to posterity, and the saving in annual repairs and horse labour that will be the result will before long pay off the original cost of the improvement."

But little consideration should be required, to convince all concerned, that where practicable the route selected for a road should be the one with the least hills and gradients along its course, provided that the length of such road would not be unduly increased in so doing.

The importance attached to this matter, is being felt more and more as the modern methods of locomotion come into use.

A steep gradient to ascend on an outward journey means one to descend on the return. The risks incurred in descending steep hills are sometimes considerable, resulting at times in serious accidents, and the additional energy required in ascending similar inclines often necessitates the employment of extra horse labour; at the best of times they are fatiguing and entail much loss of time.

A further important consideration is, that the amount of repair and attention that steep gradients require are much above that of level roads, chiefly due to the use of skids on the wheels of vehicles, and to erosion of the metal caused by water scour on the surface.

With modern roads, with their smooth surface, there is frequently a danger of a horse slipping and falling down in descending steep inclines, and there is also the difficulty for a horse to gain the desired foothold to enable it to draw a weight up such gradients.

The steepest gradient that should prevail in the line of a new road—excepting where, owing to circumstances, it is necessary to depart from the rule—is that known as the "ruling gradient."

This "ruling gradient" is that inclination to be determined that will require but a moderate additional force in ascending, and no difficulty or danger in descending, and will present no practical impediment to any ordinary traffic.

Mr. Thomas Codrington considers that the ruling gradient on a macadamised road should be 1 in 30. He says: "On a level macadamised road in ordinary repair the force which the horse has to put forth to draw a load may be taken as $\frac{1}{30}$th of the load. But in going uphill the horse has also to lift the load, and the additional force to be exerted on this account is very nearly equal to the load drawn divided by the rate of gradient. Thus, on a gradient of 1 in 30 the force spent in lifting is $\frac{1}{30}$th of the load, and in ascending a horse has to exert twice the force required to draw the load on a level. In descending, on the other hand, on such a gradient, the vehicle, when once started, would just move of itself without pressing on the horse. A horse can, without difficulty, exert twice his usual force for a time, and can therefore ascend gradients of 1 in 30 on a macadamised surface without sensible diminution of speed, and can trot freely down them."

Messrs. Law and Clark say: "Sir John Macneil, in 1836, maintained that no road was perfect unless its gradients were equal to or less than 1 in 40. In thus limiting the ruling gradient to 1 in 40, he justifies the assertion by the much greater outlay for repairs on roads of steeper gradients. For instance, he adduces as a fact not generally known, that if a road has no greater inclinations than 1 in 40, there is 20 per cent. less cost for maintenance than for a road having an inclination of 1 in 20. The additional cost is due not only to the injury by the action of the horses' feet on the steeper incline, but also to the greater wear of the road by the more frequent necessity for sledging or braking the wheels of vehicles in descending the steeper portions."

Sir Henry Parnell considers 1 in 35 to be the ruling gradient, and remarks as follows:—"An inclination of 1 in 35 is found by experience to be just such an inclination as admits of horses being driven in a stage coach with perfect safety when descending in as fast a trot as they can go; because, in such a case, the coachman can preserve his command over them, and guide and stop them as he pleases. A practical illustration that this rate of inclination is not too great may be seen on a part of the Holyhead Road, lately made by the Parliamentary Commissioners on the north of the city of Coventry, where the inclinations are at this rate, and are found to present no difficulty to fast driving, either in ascending or descending. For this reason it may be taken as a general rule, in laying out a line of new road, never, if possible, to have a greater inclination than that of 1 in 35. Particular circumstances may, no doubt, occur to require a deviation from this rule; but nothing except a clear case that the circuit to be made to gain the prescribed rate would be so great as to require more horse labour in drawing over it than in ascending a greater inclination, should be allowed to have any weight in favour of departing from this general rule. On any rate of inclination greater than 1 in 35 the labour of horses in ascending hills is very much increased. The experiments detailed in the Seventh Report of the Parliamentary Commissioners of the Holyhead Road, made

by a newly-invented machine for measuring the force of traction or power required to draw carriages over different roads, fully establishes this fact."

The following is a table contained in the appendix of Sir Henry Parnell's work of the general results of experiments made with a stage coach on the same description of road; but on different rates of inclination, and with different rates of velocity, on the Holyhead Road:—

Rates of inclination.	Rates of travelling.	Force required.
1 in 20	6 miles per hour	268 lb.
1 in 26	6 ,, ,, ...	213 lb.
1 in 30	6 ,, ,, ...	165 lb.
1 in 40	6 ,, ,, ...	160 lb.
1 in 600	6 ,, ,, ...	111 lb.
1 in 20	8 ,, ,, ...	296 lb.
1 in 26	8 ,, ,, ...	219 lb.
1 in 30	8 ,, ,, ...	196 lb.
1 in 40	8 ,, ,, ...	166 lb.
1 in 600	8 ,, ,, ...	120 lb.
1 in 20	10 ,, ,, ...	318 lb.
1 in 26	10 ,, ,, ...	225 lb.
1 in 30	10 ,, ,, ...	200 lb
1 in 40	10 ,, ,, ...	172 lb.
1 in 600	10 ,, ,, ...	128 lb.

Where long steep inclines cannot be avoided, it is desirable to divide them up into lengths, by introducing at intervals short lengths of road of less gradient, which would serve to relieve the heavy strain from horses when drawing loads up the hill.

In some instances where new roads are necessary, but owing to the elevated contour of the land, and circumstances surrounding the question, a steep incline cannot be avoided, then in such cases it is sometimes advisable to lessen the incline by cutting through the summit.

The incline of a hill may in some instances be lessened by making up the road at the foot with either the material removed from the summit, or by means of other suitable substance. This road should be banked up, with slopes on each side, which, if necessary, may be further supported by retaining walls.

This procedure can often be adopted with considerable advantage in overcoming deep valleys. It is far from an uncommon occurrence to meet with a steep descent to be almost immediately followed by an ascent; in such cases it would be an improvement if the valleys between were more or less filled up. This operation not only saves a lot of tedious up and downhill work, but also shortens the distance.

In locating a line for a new road, a preliminary reconnaissance should be made. It is necessary, in so doing, that the principal characteristics of the country through which a new road is to be carried should be carefully noted.

This work is much simplified if a reliable map of the district is obtained, but should such maps not be procurable, then the work of reconnoitering will be considerably increased.

Upon the map—which should accompany the engineer when making his examination of the country—the points which appear to afford the most suitable lines can be noted, and fixed with sufficient accuracy to enable sketches to be made previously to a full survey with levels; after which the route can be finally laid out.

Contour maps, showing the principal elevations of the country, are sometimes available, and in such cases the work to be done is much facilitated, as the greater portion of the planning, after the preliminary examination, can be done on the map.

In considering the lines selected, note should be made as to the available material for embankments, where they appear to be necessary; the nature of the material to be excavated where such work is required, in which case the particular geological formations, over which it is proposed that the lines should pass, should be ascertained. The position of quarries from which stone and gravel could be obtained should be noted, together with any general circumstances and conditions that must be in favour of or against any particular line that might be selected.

It is desirable, that in cases where a turning or curve takes place on an incline, that for the safety and convenience of traffic, this deviation from the direct line should be of as large a radius as possible, and the incline at such points should be reduced.

It is sometimes found desirable to alter the line of an existing road for the purpose of reduction of distance, or improvement in gradients. This question, whatever advantages may be derived from the diversion, is one of much importance; not only the convenience of those who use the road should be considered, but the possible injury to property by the alteration must be borne in mind, or otherwise cases of compensation may arise. The advantage of such diversions to the public generally, should carry much weight, but care should be taken that as little injury as possible should be caused to neighbouring property.

Upon the line of a road being finally determined, the next business is to stake out the route. This is generally done by driving a line of wooden stakes into the ground all along the course of the proposed road. These stakes are placed at about 100ft. apart for straight roads and closer together at curves, and are so placed as to define the centre line of the work; levels are then taken along the line at each stake, from which a longitudinal section is drawn. Cross levels are also taken at intervals where considered necessary. Upon these longitudinal and cross sections the finished levels are indicated.

Width of road.—The width of the roadways of towns up to recent years has been too often insufficient for the conduct of the traffic, and in many cases considerable outlay has been necessary to remedy these congested conditions, in purchasing and removing property for street-widening purposes. This is an experience that nearly every town has had at one time or another. In country roads situate between towns of importance, and thereby subjected to much traffic, the width of such roads should not be less than 36ft., and should include a 6ft. path on one side, but in ordinary country roads not so situate the width is not of so much importance, as it is seldom that more than two vehicles are required to pass one another at a time. A width sufficient to meet the requirements of the traffic in each direction is all that is needed, and the cost of an unnecessary width of roadway to construct and maintain is avoided. Such roadways therefore require to be only about 18ft. in width. Although the roadway need not be of greater width, yet it is most desirable that the distance between hedge and hedge should be of the full width of 30ft. to 36ft. This may be accomplished by leaving a strip of grass land at each side through which footpaths could be made and sub-drains carried. By so arranging the width, the road is exposed to the full benefit of the sun and wind, which is essential to obtaining a dry and good wearing surface.

On this subject Mr. Macadam, in answer to the question, "What width would you in general recommend for laying out a turnpike-road?" remarks:—"That must depend upon the situation. Near great towns roads, of course, ought to be wider than further in the country. Roads near great towns ought not to be less than 30ft. or 40ft. wide; but at a distance from great towns it would be a waste of land to make them so wide." (Evidence before a Committee of the House of Commons, 1819.)

Road boundary walls, &c.—Hedges and close-boarded fences should not be placed at the sides of country roads unless they are kept low enough or at sufficient distance away, so as not to obstruct the action of the wind and sun. The free exposure of country roads to

both the drying effects of the wind and sun are most essential, in order to maintain the surface in good condition for any length of time. Attention to this is important, not so much from the fact of the convenience and comfort afforded by a dry road, but that the effect of wet has a great tendency to weaken and cause the road to wear more quickly and cut under the weight of the traffic.

Trees in streets also have an injurious effect on roads, and sometimes are the cause of a road being kept wet for a considerable time by the dripping of water from their leaves

From another point of view, however, it is desirable to have trees in roads, as they afford shade from the blaze of the sun, which in some streets in summer time is almost unbearable to horses as well as to pedestrians. Trees are further a great attraction, and beautify the perspective of thoroughfares. In the country where trees are planted on each side of the road special attention should be given to see that no hedges or walls are allowed to exist along the line to obstruct the free action of the wind under the trees.

In selecting trees for street planting the description of tree must be considered in conjunction with the

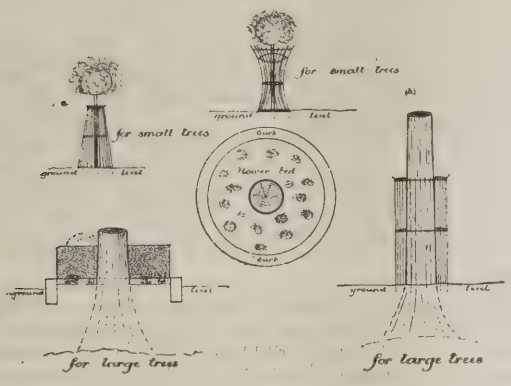


Fig. 2.

locality and conditions to which they will be subjected. Trees of light foliage and small growth are more suited for this purpose than the more dense and larger variety. Where planted in pavements it is advisable to place an iron grating over a portion of the earth surrounding the tree so as to admit air and a small quantity of water to the roots; the earth over the roots is in some towns allowed to remain exposed and frequently used as a flower bed. It is further advisable that all young trees growing in streets should be protected by a tree guard, as illustrated—Fig. 2—to prevent the trunk from being injured by horses or mischievous persons.

(*To be continued.*)

National Health Society.

OFFICIAL TRANSACTIONS.

Special Training Lectures.—The next course of training lectures for the Certificate of the Sanitary Inspectors' Examination Board, and for the Diploma of the National Health Society, will be commenced on Monday, September 16th. Full particulars and prospectus can be obtained from the Secretary, 53, Berners-street, W.

A Local Government Board inquiry was held at Egremont, before Mr. E. Petronell Manby, M.D., last week, with reference to an application by the District Council for sanction to borrow £15,500 for hospital extensions.

SANITARY LAW (A).*

By Trevor Edwards, Esq., West Riding Solicitor.

THE PUBLIC HEALTH ACT, 1875, AND THE MODEL BYE-LAWS THEREUNDER.

(*Continued from page* 515.)

I have taken up more of your time than I intended in considering what I may call the approach to the Public Health Act, 1875. I will now briefly sketch the procedure in connection with, say, three subjects:—First, the course to be taken by an Inspector of Nuisances in relation to unsound meat; secondly, the course to be taken in relation to a common nuisance; and, thirdly, I will refer to the sections of the Act which confer the power of entry upon private premises.

First, as to unsound meat:—There are few duties that ought to weigh so heavily upon Inspectors as those in relation to unsound meat, and because these duties are so important and urgent, the powers conferred upon them are correspondingly large. Whenever you find the Public Health Act conferring drastic powers, you may at once assume that the Legislature has attached very great importance to the underlying subject. The greater the effect of an act upon life or health, the greater the power of protection or prevention. The code dealing with unsound meat is all contained in four sections, 116 to 119. Section 116 gives the Inspector of Nuisances every reasonable power to go wherever he likes in his district to inspect meat, food, fish, fruit, milk, &c., exposed for sale or deposited in any place for the purpose of sale, or of preparation for sale and intended for the food of man. If medical men could only give us statistics of illness and deaths from the consumption of unsound food, especially meat, we should all be horrified. The framers of these sections were not without much knowledge on that point, hence the large and arbitrary powers. The possession of these powers confers a grave responsibility. I sometimes think that the powers are not sufficiently and systematically exercised, especially with respect to compounded foods, such as sausages and the like. Far be it from me to detract from the general honesty of those who provide our food supplies, but in every community there are some who, by hook or by crook, will endeavour to enrich themselves even at the cost of the sufferings of others. It is against such people that Inspectors of Nuisances may very properly and rigorously exercise their great and responsible duty.

When an Inspector in performing his duty under this part of the Act comes to deal with any article of food he may be in doubt whether the food falls within the statute or not, although he may be convinced that it is most suspicious. Such a situation at once points to the necessity of the Inspector possessing knowledge of an expert nature; and this remark applies to all other duties under the Act involving executive authority. The responsibility, therefore, of deciding whether to seize or not calls for qualities in him other than those we are considering this afternoon, namely, a mere knowledge of the Public Health Acts.

The question which he has to decide is whether the food is sound or unsound within the meaning of the Act of Parliament, this is (as in most things) a question of degree. If it is not unsound and he proceeds with the case he may be the means of involving his Authority in considerable expense, and thereby lessen his own reputation. If, on the other hand, he gives the owner the benefit of *his* doubt he may let loose upon those

* Third Lecture delivered to the Health Officers of the West Riding of Yorkshire April 27th, 1901, at the Philosophical Hall, Leeds.

who buy the "doubtful" food the cause of much discomfort or illness, or even death. The circumstances may be such that time will not allow the Inspector to consult the Medical Officer of Health. It is therefore imperative that the Inspector should be so well versed in all conditions of unsound foods, and also the appearances, smell, &c., attending on decomposition and degeneration as to enable him to discharge his task without anxiety.

If he exercises his executive authority and seizes the article he must take it before a Justice who, in case he condemns it, corroborates and supports the action of the Inspector, and thus divides the responsibility. The Justice has thus an equal responsibility cast upon him. Although a different opinion has been expressed, in my judgment the Justice must examine the article himself before making an order. If he does make an order then it will be the duty of the Inspector to destroy the food or otherwise dispose of it so as to prevent it from becoming the food of man.

Secondly, I turn to a section known to every one of you. I refer to Section 91. This is the section that deals with general nuisances. The first of the nuisances enumerated in the section is described thus:—

"Any premises in such a state as to be a *nuisance or injurious* to health." You will notice the section says nuisance *or* injurious to health, not nuisance *and* injurious to health. There may be a nuisance which, although not injurious to health, may so incommode or inconvenience persons as to diminish their comfort of life.

If you have any difficulty in judging for yourself whether any condition of things that you may meet with in your district is a nuisance within Section 91 of the Act, you will invariably have time to confer with the law officers of your Authority, though if you have carefully read the section you will probably not have many instances where you need take that course.

Lack of time compels me to pass unnoticed the other classes of nuisance specified in this section. Having satisfied yourself that a nuisance exists, it is then your duty to report it in the proper phraseology of the Act to the Sanitary Authority, who will inquire into it upon your report, and if they confirm your opinion will order a notice to be served upon the owner or the occupier, as the case may require, to abate it. The further procedure in the event of default is prescribed in great detail.

Before touching on my third point I would especially ask you to note Section 92, which declares that:—"It *shall be the duty* of every Local Authority *to cause to be made* from time to time *inspection* of their district, with a view to *ascertain* what nuisances exist calling for abatement under the powers of this Act, and to enforce the provisions of this Act in order to abate the same; also to enforce the provisions of any Act in force within their district requiring fireplaces and furnaces to consume their own smoke."

The Act of Parliament thus expressly lays upon Sanitary Authorities the duty of having periodical inspections made of their district, and Inspectors are the Authority on the spot. If ever you have any doubt as to the limit of your duty under the Act I would advise you to read Section 92—you cannot want a wider charge than is given there. It is wholly wrong, as some think, that a Sanitary Authority or its officer must be put in motion—the above section makes it clear above all doubt that the primary principle of the Sanitary Code is to *prevent* harm and not merely to remedy it. I have been told by chief constables that they reckon their most capable officers to be those who keep their beats *free from crime* and offences, and not necessarily those who have the largest number of prosecutions. Let the same apply to Inspectors of Nuisances with even greater force, and see to it that by vigilance and foresight your district is *kept free from nuisances*. It will show that you have brought to bear upon the people of your district, not the powers of the law, but your moral force, which is far more effective. You will find—and find increasingly—that if you point out a sanitary defect or what will culminate in defect to owner or occupier in a proper manner and indicate how it can be avoided or remedied, you will, in the generality of cases, find that they will do what is right and also award you their thanks in mind if not in words. At times, of course, it may be necessary to remind them that you have the law to fall back upon. If, however, you commence at the outset to terrorise people with law they will fight you, and if you flaunt the Public Health Act too much in their faces it will only have the effect of creating prejudice against you.

(*To be continued.*)

SHOULD SANITARY INSPECTORS WEAR UNIFORMS?

An objection on the part of a Sanitary Inspector to wear a uniform led to a lively half-hour at a recent meeting of the Lambeth District Council.

The Public Health and Sanitary Committee reported that Mr. Ernest Howes, Sanitary Inspector for Trinity Ward, had refused to be measured for and to wear the uniform prescribed by the Council. The Committee had interviewed the Inspector, who adhered to his refusal, and declined to resign his appointment when called upon to do so. The Committee therefore recommended that the Inspector be dismissed from the service of the Council for insubordination and disobedience to orders, and that the Local Government Board be informed accordingly.

The Mayor read a letter from the Inspector, in which he stated that he did not absolutely refuse to wear the uniform, but informed the Committee that he would appeal to the Local Government Board on the point. He had now appealed to that body, and as a result withdrew his objection. In these circumstances he hoped the Council would remove his suspension, and allow him to resume his duties.

Councillor Barnard moved that the apology be accepted.

The Mayor did not think this was an adequate apology. Mr. Howes was extremely rude to the Committee, and the matter should be referred back in order that he should offer a proper apology.

Councillor Sharp rose to speak.

The Mayor, whose eye was not caught by Councillor Sharp, put the motion to refer the matter to Committee, while the Councillor was on his feet, and declared it carried.

Councillor Sharp: It was my intention, Mr. Mayor, to oppose the matter going back.

The Mayor: Next business.

Councillor Sharp protested against being "snuffed out" in this way.

The Mayor: Order, order.

Councillor Sharp: I protest against your conduct in refusing to allow me to speak.

The Mayor: You will have a chance of speaking when the matter comes up again.

Councillor Devereux joined in the protest, and said it was also his intention to speak had not the Mayor rushed the voting.

The Mayor: Order, order. Next business.

Councillor Devereux moved the adjournment of the Council as a protest against the action of the Mayor, but the motion was negatived.

SOCIETY OF ENGINEERS.

A VERY interesting visit was made by the members and associates of the Society of Engineers on Wednesday, June 12th, 1901, to the air-compressing station for the Shone system of sewage ejection at the sewage disposal works, Erith, Kent, and the engineering works of Messrs. Fraser and Chalmers, which are also situate at Erith.

Amongst those present were Mr. Charles Mason, president; Messrs. Percy Griffith and D. B. Butler, vice-presidents; Messrs. J. Bernays and W. G. Peirce, past-presidents; Mr. Maurice Wilson, member of Council; and Mr. Perry F. Nursey, secretary.

THE AIR-COMPRESSING STATION.

The Erith sewage disposal works, in which the air-compressor plant is working, are situate in the Manor-road, Erith, at the east boundry of the district on the banks of the river Thames, and occupy about two acres of land. The gas engine air compressors are four in number, being two sets in duplicate. The first pair produce the compressed air for working the Shone ejectors for pumping the low-level sewage. These engines were made by Messrs. Crossley Brothers, and comprise two Otto gas engines and air cylinders, each to compress 158 cubic feet of free air per minute to 11 lb. per square inch. The second pair produce the compressed air for the sludge pressing and for driving the mixing machinery. The gas cylinders indicate 25 horse-power each engine, and the air cylinders are capable of delivering 250 cubic feet of 100 lb. per square inch of air per hour. All four engines have automatic arrangements for throwing the air cylinders out of work when the working pressure in the receiver is reached. The second pair have this apparatus so arranged that the air cylinders can be entirely thrown out of work for any desired period. In addition to the foregoing, small air pumps are fixed in each ejector chamber in order to pump out the condense water from time to time as it accumulates in the chambers. Dowson gas is used for the gas engines, and is produced by the plant erected at the works by Messrs. Paisley, Welsh, and Co.

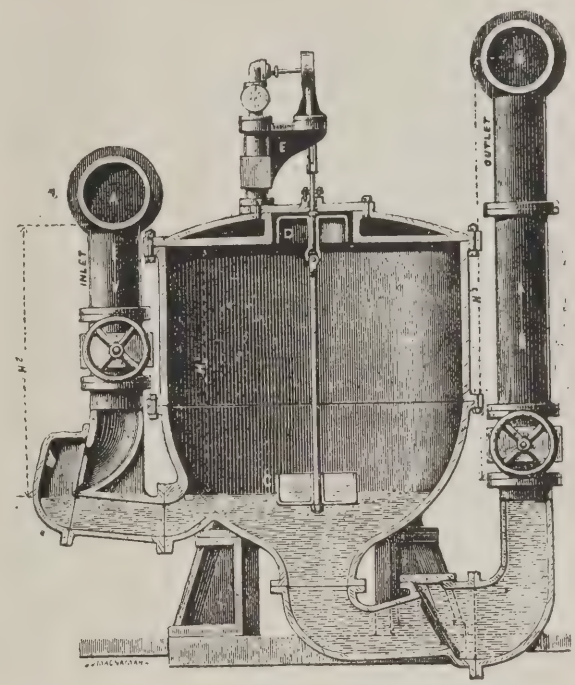
The air main is laid at a depth of about 4ft. along the Manor-road, High-street, West-street, Lower-road, and Lower Abbey-road, to the several automatic ejectors situate in those roads, the last station being about three miles from the works. Following are particulars of station plant:—

Station No.	Name of station.	No. of ejectors.	Discharging capacity of each ejector in gallons per minute.	Size of air supply, inches.	Size of air exhaust pipe. inches.
1	Appold-street	2	300	2½	2½
2	High-street	2	200	2	2
3	Lower-road	2	150	2	2
4	Station-road, Belvedere	2	150	2	2
5	Lower Abbey-road	2	50	2	2

The compressed air is delivered to the ejector stations through 4600ft. run of 4in. cast iron socket pipe, jointed with yarn and lead, and 10,900ft. run of 3in. similar pipe. All the pipes were tested to a pressure of 40 lb. per square inch. The fall in pressure in one hour does not exceed 5 lb. The compressed-air pipe is provided with stop valves close to each of the automatic valves, so that each of the ejectors can be repaired independently of the working of the others. Syphons for drawing off water are constructed at several points in the air main.

THE SHONE EJECTOR SYSTEM.

The Shone system of sewerage may be briefly described as a system of distributed stations for the lifting of sewage, worked from one central station by means of compressed air, whereby the whole drainage area is divided into a number of compact districts, each with its separate outfall and discharging station, the discharge from all the stations converging into one common main leading to the ultimate common outfall. The system is applicable wherever the sewage of a town or district requires to be lifted. Annexed is a sectional view of Shone's pneumatic ejector.



The motive power employed is compressed air, and the action of the apparatus is as follows:—The sewage gravitates from the sewers through the inlet pipe A into the ejector, and gradually rises therein until it reaches the underside of the bell D. The air at atmospheric pressure inside this bell is then enclosed, and the sewage, continuing to rise outside and above the rim of the bell, compresses the enclosed air sufficiently to lift the bell, spindle, &c., which opens the compressed-air admission valve E. The compressed air thus automatically admitted into the ejector presses on the surface of the sewage, driving the whole of the contents before it through the bell-mouthed opening at the bottom, and through the outlet pipe B into the sewage rising main or high-level gravitating sewer, as the case may be. The sewage can only escape from the ejector by the outlet pipe, as the instant the air pressure is admitted on to the surface of the fluid the valve on the inlet pipe A falls on its seat and prevents the fluid escaping in that direction. The fluid passes out of the ejector until its level therein reaches the cup C, and, still continuing to lower, leaves the cup full until the weight of the liquid in the portion of cup thus exposed and unsupported by the surrounding water is sufficient to pull down the bell and spindle, thereby reversing the compressed-air admission valve, which first cuts off the supply of compressed air to the ejector and then allows the air within the ejector to exhaust down to atmospheric pressure. The outlet valve then falls on its seat, retaining the liquid in the sewage rising main, and the sewage flows into the ejector through the inlet once more, driving the free air before it, through the air valve, as the sewage rises; and so the action goes on as long as there is sewage to flow. The positions of the cup-and-bell floats are so adjusted that the compressed air is not admitted to the ejector until it is full of sewage, and the air is not allowed to exhaust until the ejector is emptied down to the discharge level. The compressed air for

actuating the ejector is produced at a central station, and is conveyed in iron pipes laid under the streets to the several ejector stations, as already explained. The Shone ejectors at Erith were supplied, and the air mains laid, by Messrs. Hughes and Lancaster.

MESSRS. FRASER AND CHALMERS' WORKS.

These works have been in operation for about ten years, and are well equipped with modern tools and appliances. The manufactures carried on are gold and silver mining machinery, hoisting and pumping engines. Riedler patent mechanically-controlled valves for pumps and air compressors. The iron foundry is 220ft. long by 150ft. wide, and has four bays; the two centre ones are each of 50ft. span, and the sides 25ft. span. The centre bays are served with three travelling cranes of 5, 15, and 25 tons capacity, also four hydraulic cranes of 3 and 5 tons capacity. Besides the three large core ovens of 4000 cubic feet capacity each, there is installed the Piflin portable stove, by which the largest moulds are dried on the floor at less cost than by the old method of fixed core ovens.

The boiler shop measures 220ft. by 120ft., and consists of three bays. The centre bay is of 60ft. span, and is served with a 25-ton power-driven travelling crane. The side bays contain shears, punching and planing machines, and are served with jib cranes.

The wood-working shop is a two-storey building, 120ft. by 60ft., and has a lumber shed adjoining, 220ft. long. These shops contain the most modern wood-working tools suitable for getting out stamp mill frames and other work required in stamp mill practice. The upper floor is the pattern shop, which is also supplied with suitable wood-working machines. The blacksmith's shop is 140ft. by 60ft., and is equipped with four steam hammers, and band and circular saws. One end of this building is fitted up as a polishing shop, where all the work is polished before being shipped.

The machine and fitting shop is 440ft. long by 110ft. wide. One end, 180ft. long, has a centre bay 50ft. wide, served with two travelling cranes of 20 tons capacity, 24ft. high above the floor. Side bays, 25ft. wide, are served with hand-travelling cranes of 5 tons capacity. The centre part of the building, 200ft. long, contains four bays. This part of the shop is occupied by lathes, planers, and other iron-working tools, and most of the machining is done here, the hand fitting being done in the side bays in the part first referred to. The last 60ft. is an erecting shop, which is served with an electric crane of 25 tons capacity, and an auxiliary 5-ton hoist on the same trolley as the main hoist. In this shop is a pit 80ft. long by 20ft. wide and 8ft. deep, covered with a removable floor, so that in erecting vertical engines there is a vertical height under the crane of 45ft.

The works are connected by rail with the South-Eastern Railway, and cars can be loaded direct from the machine-shop cranes. Machinery can also be shipped by barge to the London Docks, the works having wharf facilities, and a loading crane that will handle any machinery that is shipped that way.

ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

THE following have been elected as the new Council:—President, Mr. E. George Mawbey (Borough Surveyor, Leicester); vice-presidents: Messrs. J. P. Barber, W. Weaver, and T. H. Yabbicom; ordinary members of Council, Messrs. W. N. Blair, A. E. Collins, A. Creer, A. T. Davis, A. D. Greatorex, E. P. Hooley, A. B. Macdonald, J. Paton, S. S. Platt, J. Price, H. T. Wakelam, and C. F. Wike; hon. secretary, Mr. C. Jones; hon treasurer, Mr. Lewis Angell.

MUNICIPAL OFFICERS' ASSOCIATION.

THE SUPERANNUATION BILL.

THE members of this Association were favoured with brilliant weather on the occasion of a district meeting which was held at Tunbridge Wells on Saturday last. Most of the members journeyed down from Charing-cross in specially-reserved carriages. They were received at the Town Hall at 11 o'clock by the Mayor of Tunbridge Wells, the Clerk, Mr. W. C. Cripps, and the chief officers of the Corporation, and after an address of welcome from the Mayor the party paid a visit to the various municipal establishments, including the Telephone Exchange and switch-room, the Public Baths, the Electricity Works, and the Grosvenor Recreation Ground. This tour of inspection having been concluded, an adjournment was made to the Clarendon Hotel for luncheon.

Mr. C. W. TAGG (Camberwell), who presided, proposed the health of "The King and Queen," and afterwards asked the company to drink to the cause. Both toasts were heartily received. In the course of a short speech he said they were glad to have an opportunity of visiting the historical town of Tunbridge Wells, and he expressed a hope that all the municipal officers in the district would join the Association. Mr. H. JONES (Kensington) gave "The Chairman," and Mr. TAGG briefly replied.

The afternoon was spent in visiting the Corporation waterworks at Pembury and the famous High Rocks. On returning, the members were entertained at tea by Mr. W. C. Cripps, the Town Clerk, at his residence, "The Lawns," Camden Park.

In the evening a meeting was held at the Town Hall, Mr. J. Wilson (Croydon) presiding, in the unavoidable absence of Mr. G. L. Gomme (London County Council), the president of the Association.

The MAYOR OF TUNBRIDGE WELLS, in an address, said he hoped that they had been able to spend a pleasant day. Commenting upon the rapid growth of the borough, he mentioned that they had taken up many enterprises, including the waterworks, the local telephone service, and the baths. Their telephone system, which would shortly be complete, was, he ventured to think, one of the best in the country.

The TOWN CLERK explained that Tunbridge Wells had been able to go in for municipal trading to a larger extent than many larger boroughs, because it had the advantages of a large rateable value.

Mr. J. WILSON (Croydon), in the chair, expressed his appreciation of the kindness they had received at the hands of the Mayor and officials of the Corporation.

After some business of a formal character had been disposed of,

Mr. WILSON made a few remarks on matters of interest to the Association. There were other objects for which it existed besides the obtaining of superannuation, although that was the thing to which they were turning their energy at present. The Association had been brought into existence to safeguard the interests of municipal officers, and this function it had performed faithfully. The speaker next went on to refer to the excellent qualities of their president (Mr. Gomme) and to the many concessions which the Association had been able to get for members. The time might also come when they would have a benevolent orphan fund.

Mr. TAGG (Camberwell) next spoke on the superannuation question, making reference to the future policy of the Association, as to the most desirable form of Bill to promote, viz., compulsory, adoptive, or permissive. What they had to look at, said Mr. Tagg, was which was the best means of obtaining what they desired. Should it be compulsory, adoptive, or permissive? He reviewed the history of the whole question at some length, explaining that the Poor Law

Officers' Superannuation Act had not been an unmixed blessing to municipal officers, as many of the highly-paid officials under the Poor Law had been the first to take advantage of the measure, and this had set many Local Authorities against superannuation. Then, again, the Association of Municipal Corporations were opposed to. Under these circumstances he thought that the only solution to the question was by getting an adoptive Act passed. Such an Act would not take away the power of the Local Authority, and would be much easier to get through Parliament. No Government, be it Liberal or Conservative, no matter how strong its majority, could pass a Bill like the one the Association had at present drawn up; and he advocated that the Association should run an adoptive Act next session.

Mr. KEEN (Hammersmith) moved that the Executive Council should be instructed to draw up a Bill on the lines suggested by Mr. Tagg.

Mr. J. EARWICKER (Croydon) seconded.

Mr. C. J. F. CARNELL (Sevenoaks) did not agree with the principle of an adoptive Act, but thought that it should be compulsory, and that the contributions should be paid into a central fund.

Mr. CARNELL (Camberwell), who also spoke in favour of a compulsory measure, urged the Association not to come to a hasty decision.

Mr. JONES (Kensington) deprecated the change of tactics. It appeared they were dropping superannuation altogether by this new policy of Mr. Tagg's. If they were entitled to superannuation they should go through until they got it. He did not favour an adoptive measure of any description.

At this juncture, Mr. TAGG suggested that the resolution should be withdrawn in favour of a simple reference of the matter to the Executive Council.

This was agreed to, and the usual vote of thanks brought the meeting to a close.

CORRESPONDENCE.

(*To the Editor of* THE SANITARY RECORD.)

(*We do not in any way hold ourselves responsible for opinions expressed by our correspondents.*)

SCAVENGING IN CAPE TOWN.

SIR,—Adverting to a paragraph which appeared in your worthy journal on April 25th, 1901, it may interest you to hear that the police without any warning decided to prosecute persons placing refuse tins on the side of the streets, for the convenient removal of the same by the scavenging carts—which practice obtains in the best regulated towns in England—and among the few that were prosecuted, my maid was one. The tin contained innocuous paper, leaves, and street dust deposited in my garden during a severe gale, and it was placed close to the gate. The case was not defended, as, doubtless, under the present circumstances, it might be wrongly interpreted.

Credit is due to the police for taking such energetic action; but it may be interesting to note that we do not hear of further prosecutions, although "one might express surprise at the lax examples" to be seen daily.—Yours faithfully,

R. O. WYNNE ROBERTS,
City Engineer.

Town House, Cape Town,
Cape of Good Hope,
May 28th, 1901.

SANITAS SANITATUM OMNIA SANITAS.

WE have received the following letter on the above:—

G. CECIL DICKSON, Esq., Medical Officer of Health, Carnoustie, writes:—"In answer to Query 2220 (June 6th), I enclose extract of speech from that interesting book, 'The Wit and Wisdom of Beaconsfield.' So the policy of sewage goes back a good many years:—Speech by Disraeli at Aylesbury Royal and Central Bucks Association, September 21st, 1864: 'A very great scholar observes that in his opinion the declaration of the wisest of mankind—"Vanity of vanities, all is vanity"—was not a misprint but a mistake of the copyist, and that he believed the words were not "Vanitas vanitatum omnia vanitas" but "Sanitas sanitatum omnia sanitas." Now I quite agree that it must have been a misquotation of the wise King of Israel, and if so that they would have constituted one of his best claims to be considered the wisest of mankind.'"

P. TARGETT ADAMS, Esq., Medical Department of the General Post-office, also writes:—In reply to your correspondent in Query 2220, "*Sanitas Sanitatum omnia Sanitas*," I fear I am unable to answer his query as to whether the late Lord Beaconsfield paraphrased the old epitaph from which it is undoubtedly derived, viz.: "*Vanitas Vanitatum omnia Vanitas*," which may be seen in the engravings of the famous Thomas Bewick; as, for instance, on page 202 of the first edition of "British Birds." It is a favourite quotation of those ignorant and obstructive persons, opposed to sanitary reform of any kind whatsoever, and quite improbable (at least with this interpretation) as coming from one blessed with so much sound common sense as the late lord referred to; although it is possible he may have used the phrase with a widely different meaning from that with which I have heard it so often associated.

THE PLUMBERS' COMPANY.

A DISTRIBUTION of Certificates of Registration to some 200 master and operative plumbers was held at the Guildhall this week.

Attention was called by the Master of the Plumbers' Company to the indenture of apprenticeship for plumbers in London, framed by the Plumbers' Apprenticeship Board, containing covenants providing that the apprentice should attend and diligently study at such classes of any technical institution or trade school now or hereafter to be established in London as approved by the Board. The instruction to be in sanitary plumbing and in the practice of the plumber's art, and the apprentice to present himself for such examinations in technical knowledge and workmanship as may from time to time be prescribed for the purpose of the National Registration of Plumbers.

Leith.—The annual report of the Sanitary Inspector for Leith, Mr. George Alexander, has been issued, and shows that under the Public Health and Burgh Police Acts 887 complaints were received, exclusive of those in which no action fell to be taken by the Department and those relating to dirty staircases. Rat-infested houses caused some of the complaints, the grounds of which were removed, while the total number of inspections made in regard to nuisances was 6553. There were seven common lodging-houses, with registered accommodation for 919 lodgers. At the public slaughter-house 10,733 animals were slaughtered, of which 84 were condemned, 49 being found to be suffering from tuberculosis. With regard to the cemeteries a preliminary inspection of South Leith parish churchyard disclosed the fact that the public portion is nearly full, but before any definite report can be issued a more exhaustive examination will require to be made.

NOTICES.

ANNUAL SUBSCRIPTIONS.—The Annual Subscription to "THE SANITARY RECORD," for the United Kingdom, paid in advance, is 12s. 6d. For the Colonies and Abroad, 15s This includes postage, and a Copy of the Diary, post free.

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The Sanitary Record
AND
Journal of Sanitary and Municipal Engineering.

JUNE 20, 1901.

THE MILK STANDARD.

THE decision of the Board of Agriculture with reference to the Milk Standard has now been announced. In reply to questions on the subject in the House of Commons last week, Mr. Hanbury stated that, after carefully considering the evidence submitted to the Departmental Committee and their reports, he proposed to fix a standard under which, for the purposes of the Food and Drugs Acts, a presumption would be raised that milk was not genuine unless it contained 3 per cent. of milk fat, and 8·5 per cent. of non-fatty milk solids. Regulations to this effect were being prepared, and he proposed that they should come into effect on 1st August. It will be remembered that the majority report recommended a standard of 3·25 per cent. of fat. The minority report (Mr. Barham's) recommended that from March to June inclusive, the standard of fat should be fixed at 2·75, and for the remaining eight months of the year at 3 per cent. The standard fixed is of the nature of a compromise between the two. With every desire to secure a high standard for our milk supply, it must be confessed that there are undoubted difficulties with regard to the adoption of the standard recommended in the majority report. There has been a great outcry in the dairy trade that such a standard is an impossible one, in view of the great variations in the quality of the milk, which is influenced by such causes as the individuality of the cow, the period of lactation, the season of the year, the food she was consuming, the temperature or climatic causes, and the like. On the one hand there is the danger that with too vigorous a standard, genuine milk, though of poor quality, might be condemned; and, on the other, that with too low a standard the door would be opened to fraud. In illustration of some of these difficulties, we may refer to some figures which were given at the Congress of the British Dairy Farmers' Association the other day. At that Congress one gentleman, Mr. Allesbrook, Wollaton, gave the results of three analyses of milk taken from the same lot of cows under the same conditions, the first of which, from the morning milk, only showed 2·75 per cent. of butter fat, while the evening milk yielded 5 per cent., and another morning's milk gave no more than 2·8 per cent. These figures were seriously questioned by Mr. John Hunter, the Edinburgh analyst, who, speaking from the experience of forty years in the analysis of milk, did not think so great a variation possible between the morning and evening milk of any one herd of cows, if the whole milk was taken; but Mr. Allesbrook replied that the analyses he gave were made by the City Analyst of Nottingham, and, as a producer and seller of milk of forty years, he thought the results were just what might be expected. So far is it possible for experts to differ! An almost identical case of wide variation was given by another gentleman from Bristol. A rather significant fact was mentioned, in this connection, by Dr. Drinkwater, another analyst of experience. He found from his note-book, he said, that during the last fifteen years there had not been a single prosecution for afternoon milk, the Inspectors invariably taking the morning milk for their analyses. Keeping all these facts in view, we think the dairy trade should be fairly well satisfied with the Department's decision, for it will be observed that it does not propose to introduce a cast iron standard with an inflexible limit: it simply establishes a *presumption* of adulteration in cases below the 3 per cent., which may, of course, be overcome by satisfactory proof that the milk in any particular case is actually genuine.

The New Factories Bill.

The discussion on the second reading of the Bill brought forward by the Home-office for the amendment of the Factory and Workshops Acts was on the whole extremely friendly and favourable. The Bill was well received. For the moment the air was cleared of party spirit, and the one desire animating all sections of the House appeared to be to make the Bill a really useful and serviceable measure. It was criticised in some quarters as not going quite far enough, and some of its provisions will doubtless be subject to modification or enlargement in Committee, but the general consensus of opinion was that it marked a large advance on the Bill of last year, and would effect a great improvement on the existing law. An amending Bill such as this one is so full of detail, and deals with such a variety of subjects, that it is impossible in the present notice to traverse it except in its most salient features, more particular criticism being reserved till the Committee stage, when it can be examined clause by clause. Let it suffice, therefore, to say that its more exclusively sanitary provisions are excellent in scope, and aim at changes in the law which were much needed—such, for example, as that dealing with the ventilation of workrooms. The Home Secretary, in explaining the provision, remarked that there were many cases in which girls were crowded together in rooms heated by gas jets, the faint noxious fumes of which were practically never changed. Precisely such a case occurred not long ago, and was reported at the time in this journal, in which the Bench, though sensible of the justice of the complaint, was powerless to convict, as the existing law was not sufficiently wide. Under this Bill it will be required that in all such places there must be sufficient ventilation. Another useful provision of the Bill relates to bakehouses, following the precedent of the London Public Health Act, 1891, and provides that all places where the floor of the room is 3ft. below the surface of the ground should be considered underground. In such cases the Local Authority is charged with the duty of seeing that they are sanitary and in other respects suitable for the trade carried on there. Then a number of works and industries, hitherto exempt, are to be brought within the operation of the Acts—such as electrical and cognate works, and the processes of fruit-preserving and fish-curing. With regard to these latter, there will be some relaxation during the busier seasons of the year, so far as the question of hours is concerned; but in all questions of sanitary administration they will be brought under the Acts. One of the most important features of the Bill is that laundries are now definitely to be scheduled as workshops, and religious and charitable institutions, where laundry work is carried on, are not to be excluded. The Home Secretary, however, indicated that there would be some modifications as to the inspection of such institutions, the nature of which would appear more fully in Committee. On this point there is certain to be controversy; but, in the meantime, it is well to reserve criticism. We shall watch the progress and further development of the measure with much interest, in the expectation that it will be shaped into a most useful piece of legislation.

Unqualified Pharmaceutical Assistants in Scotland.

The summer session of the General Medical Council contained, in its roll of disciplinary cases, one which raised a question affecting a considerable proportion of the profession, at least in the West of Scotland. A doctor was charged with having habitually employed as assistants for the sale of drugs and poisons persons who were not duly qualified, thereby causing them to commit breaches of the Pharmacy Acts. They had, under cover of his professional qualifications, sold scheduled poisons to the public, from which lamentable consequences had resulted. No penal action was taken in regard to the case, in respect that the case was the first of the kind, and that the accused practitioner assured the Council that he would in future carefully avoid any similar ground of complaint. The case, however, has raised a strong feeling among the doctors in Glasgow and the West of Scotland, who seem to consider that the decision of the Council establishes a precedent which will deprive them of their right to sell drugs and poisons. Whatever may have been the case in other parts of the country, it has, we understand, been the practice in the West of Scotland for hundreds of years for doctors to conduct dispensaries or druggists' shops in connection with their practices. In the old days, we are informed, it was the universal custom for practitioners to begin their practice in shops. The action of the General Medical Council will, it is believed, have the effect of striking at this long-established usage. Accordingly, at a public meeting of medical practitioners held in Glasgow recently, it was resolved to memorialise the General Medical Council on the subject. In the memorial, which was signed by 400 practitioners, it was pointed out that it was impossible to teach the business of dispensing without employing unqualified assistants, and it was contended that to subject registered medical practitioners to the risk of being struck off the register because a salesman of theirs sold drugs or poisons was unauthorised by Act of Parliament. A deputation was also appointed to wait upon the Council in support of the Memorial. The Medical Council, however, refused to receive the deputation. The practice in question, it held, was one fraught with danger to the public. The sequel was somewhat singular. The members of the deputation lodged a formal protest against the action of the General Medical Council in refusing to accept the memorial, and to hear the deputation in its support.

Waterworks Engineers.

We have pleasure in calling attention to the sixth annual meeting of the British Association of Waterworks Engineers, which takes place at Birkenhead in the second week of July. Though one of the youngest of the

engineering societies, the Association has made good progress, and the interest it has aroused in the ranks of those belonging to this special branch of public service, has more than justified the hopes of its founder. Nothing but good can come out of the specialisation of the different branches of engineering, and until the above-named Association was established, the peculiar features of waterworks construction and maintenance had not received the attention they deserved. At the forthcoming meeting, Mr. W. A. Richardson, M. Inst. C.E., Waterworks Engineer to the Birkenhead Corporation, will be the President, and in the course of his inaugural address he will give some interesting details concerning the local water supply. Papers will be contributed by Mr. William Ingham, Torquay; Mr. Wm. Watts, past president (who will deal with the important subject of "The Pollution of Public Water Supplies"); and Mr. A. G. Cloake, London. In addition there will be a lecture by Mr. William E. Plummer, M.A., F.R.A.S., on "Rainfall, the Cycle of Precipitation." Compared with the programme set for most annual meetings of scientific societies this list is exceedingly brief, but we think the curtailment is wise. Far better to have two or three good papers and let them be well discussed, than have a number of mediocre contributions which neither add dignity to the proceedings nor to the reputation of the contributors. There will be quite a number of excursions; not only will the surrounding waterworks be visited, but Laird's Shipbuilding Works, the Mersey Tunnel Pumping Station, the Liverpool and Birkenhead Docks and Observatory, and Port Sunlight. Altogether the meeting promises to be the most successful yet held.

Municipal Fire Insurance.

Some time ago our esteemed contributor "Senex" indicated that a movement was in progress to secure the establishment of a scheme of municipal fire insurance. A few districts have for years followed the example of the great shipping companies, and have created a special fund to insure the property of the municipality, and such cases have worked well. The present time appears to be favourable for such a plan to be introduced into the metropolis. Lately a Committee of the London County Council has been giving special attention to the expenditure on the administration of the Fire Brigade, and the question of insurance has been included. The report of the Committee was presented last Tuesday, and in which it was stated that, "As the result of a careful consideration of all the facts, we have come to the conclusion that it is desirable that the Council should become its own insurer of its property against fire, and that the scheme formulated to give effect to this should be so drawn as to admit of all London Local Authorities entering into the scheme if and when they choose to do so. We believe that sooner or later many of these Authorities will associate themselves with the Council in this matter, especially if the Council be able to offer such Authorities a reduction of the premiums now paid. To this point we have necessarily devoted a good deal of attention, and we are convinced that the Council may with safety offer a rebate of 25 per cent. from the current rates of premium now charged by the tariff offices. We propose that, in the event of any deficiency arising on the fund, the Council should have authority to borrow on the security of the rates, repaying any sum so borrowed within a limited period. We think, however, that after a few years the fund would accumulate to a figure which would render a deficiency improbable." The suggestion is a thoroughly practical one, and might be carried out at a minimum of cost. The combination of all the metropolitan boroughs would make it an assured success.

A Fair Rent Court.

We have from time to time, in dealing with the so-called housing question, insisted that the vital matter for the people was not so much a question of accommodation as of rent. The workers have just cause to complain of the inordinate demands made upon their limited incomes by the owners of small property, and until something is done to give the tenant a security against these ever-increasing advances, anything like a satisfactory settlement will be impossible. We know that some people assert that low rents are impracticable because of the greatly-increased cost of building operations. But to this we reply that many of the most glaring rack-rents are not on new property, but on that which has been in existence for several years. We have before us instances of how rent has been raised within the past ten years. The cases quoted are from the suburbs, for increasing rents are by no means confined to the metropolis. For property letting in 1892 at 6s. per week, 10s. and more is now being asked. Nothing has been done to improve the houses, and the rates are but little higher now than they were under the lower rent. Another case is a house which had been less than £20 rent for years, where, on a new tenant coming in, it was increased about 30 per cent., and the landlord refused to do the house up, although nothing had been done to it by him for at least seven years. What we contend is that if the lower rent pays a fair return to the owner the tenant should have some security that that rent should be preserved to him, and that he shall not be compelled to choose between disturbance or accepting periodical increases. We know this doctrine may not be political economy, but we believe that it is justice and equity. And it is because of this belief that we are glad to see an effort is to be made to establish a fair rent court for London. Mr. Steadman has given notice to the London County Council of his intention to move:—"That in consequence of the growing increase in rents, it be an instruction to the Parliamentary Committee to prepare and insert a clause in the next General Powers Bill giving the Council the power to establish fair rent courts within the whole of the County of London."

MUNICIPAL ENGINEERING & SURVEYING.

CROSS-TABLE CHAT.

In my notes of last week I adverted to certain statements which had been published by a so-called "Expert" adverse to the modern (*i.e.*, bacteriological) systems of sewage disposal, and who asserted that such systems were absolutely dead. It will be of especial interest to my readers to know that another "expert," Professor W. H. Perkin, of Owens College, Manchester, has also been giving his opinion on these systems before the Royal Commission on Salmon Fisheries as to the prevention of the pollution of rivers by sewage and trade effluents. Now, Professor Perkin happens to have no special interest in any particular system, than that of satisfying himself, as a chemist of very considerable repute, as to the one which is most efficient, and this is what he says:—

Briefly the bacterial treatment of sewage and other liquids consisted in exposing them under regulated conditions to the natural agencies which everywhere brought about the decomposition of organic matter, and its final conversion into harmless inorganic forms. The purification of sewage by land was dependent on the same bacterial activities as are at work on the other systems, but the amount that could be treated is very much less in the case of land treatment (area for area), so that in many cases it is impossible.

The sewage of Manchester contained almost every imaginable kind of trade effluent, and the results obtained by its final treatment had been quite satisfactory. Certain exceptions, such as the greasy refuse from wool scouring, would probably have to be dealt with by the manufacturers before admission to the sewers: and he believed the recovery of the grease would be very profitable to the manufacturer. So far the bacterial process had been marked with entirely satisfactory results. Accrington is treating the whole of its sewage with open septic tanks and continuous filters. Manchester, Oldham, Leicester, Sheffield, Yeovil, Exeter, and many other places have schemes for treating the whole of their sewage by bacterial methods. Bradford, and Leeds, and Rochdale are faced with the wool scouring difficulty, but they all have bacterial methods in contemplation. In his opinion the system had been so successful that all towns should be compelled to adopt the treatment. If this were done there was every reason to believe that the rivers would be rapidly cleansed and able to support fish life.

This opinion is one which is in strict keeping with that which has been consistently put forward by me in this column from time to time, and is the one also held by all who have investigated the subject.

It betokens a healthy condition of sanitary administration when we see Medical Officers of Health vieing with municipal Surveyors, as they are now endeavouring to do, especially in the metropolis, to secure the responsibility of supervision over structural work appertaining to dwelling-houses. Just now, as will be seen from a report which appeared on page 446 of this journal, Medical Officers are agitating for the supervision of drainage work—both as regards old and new buildings—to be placed under their department. On this subject I have a communication from a Municipal Surveyor, who hints that some Medical Officers hold a high opinion of their own capabilities as engineers and architects, and inquires how medical men can be assumed to have acquired a practical knowledge of structural work, and asks if any Medical Officer could prove his fitness for the responsible position of drainage engineer by taking levels and preparing plans, specifications, and quantities for the drainage of a town house, and asserts that if he could not do this he should not be placed in the false position of acting as a referee on plans and schemes submitted by architects and surveyors for approval to Local Authorities.

I am afraid I cannot agree with all my correspondent's strictures regarding our medical friends. There is ample scope for the latter in most matters pertaining to public health, and they have been of great service in the past, and will, I know, continue to give such in the future to the gain of the community. Municipal Engineers and Medical Officers of Health can and should work together for the common good each within his own particular sphere, and there are abundant opportunities both for the prosecution of measures which tend to the improvement of our dwellings and the artificial conditions under which we are compelled to live in cities and towns.

While it may be urged that the Medical Officer's department should have the power to examine and certify for drainage of new buildings, so that dual control should be avoided, I would point out that such bodies as the Royal Institute of British Architects would offer strong and powerful opposition to such a course. In fact, they are now seeking to have diverted from the Medical Officers' department the responsibility for supervision of alterations of drainage to old houses. As I personally know the opinions of numerous members of the Institute, it is no secret for me to explain that they hold that the Surveyor is like themselves, a practical man who is enabled to discuss with them practical requirements and difficulties, and who is, it is said, rarely a faddist. Their opinion may be right or wrong, but I fear the Medical Officer will find this opposition unsurmountable.

Senex.

Sanitary Inspectors' Associations.

NATIONAL UNION.

The annual meeting of the National Union of Sanitary Inspectors (Midland Centre) took place at Tamworth on Saturday last. There was a representative attendance, including Messrs. W. H. Coney, chairman (Wednesbury), H. H. Spears, general hon. secretary (West Bromwich), John Peers, district hon. secretary (Chief Inspector, Wolverhampton), and representatives from Manchester, Wolverhampton, Sedgley, Siesdon, Coseley, Birmingham, Bescot and Walsall, Leamington Spa, Short Heath, Walsall, Tamworth, Atherstone, and Nuneaton. The party visited Tamworth Castle and Drayton Manor during the afternoon, after which they adjourned to Millfield House, Tamworth, where they were entertained by Mr. H. J. Clarson, C.E., the Borough Surveyor. Subsequently a meeting was held in the open air, Mr. W. H. Coney presiding. The annual report, which was adopted, showed that the progress of the Union was well maintained, the membership numbering ninety-six. Votes of thanks were passed to the retiring officers. Dr. Reid, Staffordshire county Medical Officer, was unanimously re-elected president for the year, and Dr. H. Malet, Medical Officer of Health, Wolverhampton, was elected vice-president of the Centre. Mr. Clarson, in acknowledging a vote of thanks, said he was pleased to notice an improvement in regard to the pollution of the Tame, and expressed a hope that it would continue, the river being in a better condition now than he had seen it for the last fifteen years.

Public Works.

SEWERAGE.

An inquiry is to be held at Folkestone into an application for sanction to borrow £1000 for works of sewerage.

The Quorndon Urban District Council has passed plans for the sewerage of its district. The scheme is estimated to cost £11,000.

A local inquiry was held last week with reference to a proposal of the Rural District Council of Tewkesbury to borrow £2220 for the sewerage of Kemerton.

A Local Government Board inquiry has been held at Alvaston into the application of the Urban District Council for sanction to a loan of £2000 for sewage disposal works.

Mr. H. P. Boulnois has held an inquiry at Great Sutton into an application by the Wirral Rural District Council for powers to borrow £2900 for sewerage works in the township.

The sewage purification works constructed by the Morley Town Council at a cost of £43,826, were formally opened on Monday in last week by the Mayor, Mr. Councillor C. Scarth.

The Town Chamberlain reported, at a recent meeting of the Glasgow Town Council, that from 1895-96 to date the sum of £27,557 had been spent upon the new drainage scheme.

The Willington Quay District Council has agreed to apply to the Local Government Board for permission to borrow £1360 for the purposes of defraying the cost of a new sewer and repairing streets, &c.

The Walton Urban District Council has decided to make application to the Public Works Commissioners for £4000, being the second instalment of the loan of £8200 in connection with the main sewerage scheme.

The Sewage Disposal Committee of the Failsworth District Council recommends the acceptance of the tender of Mr. H. E. Buckly, of Bingley, amounting to £1739 6s. 8d., for land filtration works at the outfall works.

A Local Government Board inquiry has been held at South Dublin relative to the application of the Rural District Council for a loan of £330 for the purpose of constructing sewerage works at Seaview-terrace, Donnybrook, the area of charge to be the rural district.

The last report of the Irwell and Mersey Joint Board showed the effluent of the Urmston and Flixton joint sewage farm to be the best out of twenty-six effluents analysed. It has been decided to construct an additional bacteria bed the same size as the present one to allow more room for storm overflow. The engineer has been instructed to prepare plans, which will also include sewer extension in Moorside-road.

The Dean of Norwich has made the following communication to the Press:—"There is not in Switzerland a centre of exercise which has grown so rapidly in dimension and in popularity as Zermatt. Twenty years ago there were but two large hotels. There are now over twenty. The drainage of what may be called, in the height of the season the town, has become a serious problem to all concerned. From time to time suspicion has been aroused as to the insanitary condition of the village. The hotel proprietors, under the lead of Herr Alexandre Seiler, have made up their minds to cope with what was becoming an increasing difficulty. They have formed themselves into a syndicate to provide the capital necessary for the introduction of drains on the most approved method. The winter was given to extensive preparation, and with the arrival of spring Zermatt was opened up and huge drains were laid, while connections were formed with other smaller drains from each of the side streets. The system runs down to the Viége-Zermatt Station; it passes thence alongside the Zermatt-Gornergrat line, and into the river Visp at one of its most rapid points. Water from the Trift-thal is kept perpetually running through the system, and from such a height the flush will be quite effective. Notwithstanding the severity of the winter, the lateness of the spring, and the magnitude of the work, it will be completed in the early summer. Two other improvements have been made. A huge reservoir has been constructed up the Trift, which supplies the hotels, fountains, fire, and irrigation pipes, and the vexatious cobstone in the central highway has given place to a smooth pavement."

WATER.

The Mumbles Water Company have under consideration a scheme to construct a new reservoir and filter beds at a cost of from £3000 to £4000.

Operations have been commenced at Bowfield in connection with the laying of a third pipe from Rowbank Reservoir to Stanley Dam, near Paisley. The contractor on the Howwood section is Mr. John Sproull, Sawmillfield-street, Glasgow.

Owing to the continuance of dry weather the Glasgow water engineer has written to the superintendent of cleansing asking that the use of water for street washing and watering purposes be, if possible, restricted, as the reservoirs are going down rapidly.

A petition on behalf of Mr. Edward Thomas and others, praying to be heard by counsel against the Llandrindod Wells Urban District Council's Water Bill when the Committee stage is reached, has been deposited in the Private Bill-office of the House of Lords. The Bill has already been passed by the House of Commons.

At last week's meeting of the St. Helen's Water Committee, Mr. Lackland, engineer, reported that he had prepared plans of the storage reservoir to be constructed at Brownedge, near the softening works, at a cost of £30,000, to hold 10,000,000 gallons. The plans were approved, and ordered to be sent to the Local Government Board, to whom application has been made to borrow the necessary money.

Mr. J. T. Wood presided at the meeting of the Water Committee of the City Council last week, when the water engineer reported on the distribution of water for the weeks ending June 1st and 8th, and for the corresponding weeks last year. The total quantity supplied, both within and outside the compulsory limits, was—Week ending June 1st, 188,761,000 gallons; average per day, 26,966,000 gallons. Week ending June 8th, 205,495,000 gallons; average, 29,356,000 gallons. For the corresponding weeks, the averages per day were 27,140,000 gallons and 27,003,000 gallons

At the last monthly meeting of the Newport County Council, Mr. Williams grew insistent as to when the report as to the ultimate cost of the Wentwood water undertaking would be presented. The total payments up to date amounted to £263,633 4s. 6d. The Town Clerk said Mr. Baldwin Latham was too busily engaged in parliamentary work just now to prepare the expected report. Mr. Little wanted to know how the present supply stood, as they are now in the dry season. The waterworks manager replied that there were 226,000,000 gallons in store, or about the same quantity as last year. The Mayor added that the water for street watering now came from outside sources.

Members of the Yeovil Town Council paid their customary visit of inspection to the source of the Yeovil water supply at Melbury last Thursday. The party left the borough in two brakes about half-past two o'clock. The first stop was at the new reservoir on Summerhouse Hill, which it was found contained about 750,000 gallons. A move was then made to the brakes again, and, notwithstanding the fact that the weather was far from summer-like, the drive to Melbury was enjoyed by all. Stockwood Spring was first visited, and here a plentiful supply of water was found. Haydon Wood Spring, from which it is proposed to augment the present supply, was also flowing satisfactorily, and Spring Pond, from which the existing mains are laid, was found to be yielding freely. The Borough Surveyor acted as cicerone, and fully explained the levels of the springs, their yield, &c. Adjoining Spring Pond a cold luncheon was partaken of, following which a few complimentary toasts were honoured; and about half-past seven a start was made for Yeovil, which was reached about an hour later. The visit proved both instructive and interesting, and but for unforeseen circumstances arising, consumers of water in the town may rest assured that there will be no curtailment of the supply in the immediate future at all events.

At a recent meeting of the Waterworks Committee of the Manchester City Council tenders were dealt with for the supply of iron pipes for the completion of the second pipe from Thirlmere to Manchester. The total quantity to be used is about 62,700 tons. The cost is estimated at about £314,000. The City Council gave instructions to the Committee some twelve months ago to proceed with the work. Since that time there has been a decline in the iron market, and a large sum in the estimated outlay has probably been saved.

The Local Government Board has written the Cowlyd Water Board sanctioning the Board's application for powers to obtain a loan of £2651, but reminding the Board that certain particulars respecting former financial transactions of the Board had not yet been supplied. The Clerk and Engineer were directed to supply the required particulars, and the Clerk was directed to obtain the money from the Public Works Loans Board. Mr. Bevan moved that a committee of five members be appointed to consult with Mr. R. S. Chamberlain, solicitor, and Mr. Farrington, C.E., and report on the advisability of procuring an Act of Parliament or Provisional Order to enable the Board to undertake the necessary works and to make such regulations as to secure a constant supply of water to the outlying districts under the Board's control. The resolution was adopted.

The Malton Rural District Council had before it on Saturday last an important question of water supply to several villages, including Slingsby and the "street villages" between that place and Malton. The Council had just reached the point of sanctioning a scheme of getting water from a reservoir at Gilling when Lady Carlisle showed that that scheme would cost £8400, and entail a rate of 1s. 7½d. in the pound, whereas one that she suggested, for getting a supply from springs on the Castle Howard estate, would only cost £4800, and the rate would only be about 9d. in the pound. Her Ladyship also observed that Slingsby and Fryston could not be forced into the dearer scheme, as they could get a plentiful supply by gravitation at a much cheaper rate. Lady Carlisle moved that the whole subject be referred to a new committee to consider the Gilling scheme as compared with others, and this was adopted.

At a recent meeting of the Northam Council, Mr. Baldwin Latham, civil engineer, estimated that £10,000 would be required for the completion of the Northam Waterworks, and the Clerk pointed out that to this £1547 had to be added for land. Mr. Lard stated that of the last £7000 borrowed, the Council only had £2400 left, and it was decided to write to the Prudential Assurance Company to see on what terms they would allow the Council to borrow a further £12,000. In reply to the Council's communication to Dart and Pollard, with regard to their delay in the completion of the waterworks, they wrote stating that had the Council not delayed so long in sanctioning the extra £1000, and in completion of the supplemental contract for the same, the work would have now been completed. They hoped the Council would now grant a further time. Mr. Gerrard said the contractors had been laying pipe at the rate of a mile per month, and the Clerk read a letter from Mr. Latham, stating that the Council ought not to grant an extension unless the contractors pay all extra costs. It was decided that Mr. Latham meet the Council and consider the matter.

The case in support of the Stockport Water Bill, by which the Corporation of Stockport seek powers to obtain an additional supply of water from the Hayfield district, was concluded last week, after which evidence was called for the petitioners, the petition of the Grove Mill Paper Company being first heard. Mr. Alderman J. W. Southern, Manchester, one of the directors, stated that the owners had an undisputed right to make use of all the water passing through the river Goyt. It was proposed by this Bill to abstract two-thirds of the contents of the Sett and the Kinder, which fed that river and provided nearly half the total water passing the mill. Any diminution of the water supply would necessitate the increased use of steam power, and thus put the proprietors to extra cost. They therefore asked that in the event of its being found that, in spite of the compensation water proposed to be given, they were obliged to use more steam power at an extra cost, compensation should be given, the amount of the damages being assessed by arbitration.

The Knaresborough Rural District Council has decided to ask the Leeds Corporation if it will, if required, supply water to the village of Felliscliffe—through which the new pipe line will pass—on the same terms as the Harrogate Corporation is prepared to supply other parts of the Knaresborough Rural Council's area.

The resolution of St. Andrews District Committee refusing the petition of certain inhabitants in Leuchars to form a special water district for the supply of the village has roused some opposition, and an appeal against the Committee's decision has been intimated to the Sheriff. A special meeting of the District Committee was held at St. Andrews last week to consider what steps should be taken to defend the resolution of the Committee. On the motion of Provost Ritchie Welch, seconded by Colonel Erskine, chairman of the meeting, a small committee was appointed to instruct the solicitor to defend the case.

From the report which is issued by Mr. C. Perrin, water examiner, on the condition of the London water supply during April, it appears that the average daily supply delivered from the Thames during the month was 112,090,634 gallons; from the Lea, 50,996,200 gallons; from springs and wells, 28,081,508 gallons; from ponds at Hampstead and Highgate, 255,970 gallons. The last is used for non-domestic purposes only. The daily total was therefore 201,424,312 gallons for a population estimated at 6,206,251, representing a daily consumption per head of 32·45 gallons for all purposes. In the appendix to the report are given the results of the analyses undertaken by Dr. Thorpe, on behalf of the Local Government Board, and a communication by Sir W. Crookes and Professor James Dewar relating to the analyses made during April at the instance of the directors of the seven water companies.

LIGHTING.

The British Gas Light Company Bill has been read a second time in the House of Lords.

The Wolverhampton Town Council reports a loss of £130 on the year's working of the electric light.

The Local Government Board has sanctioned the borrowing by the Southend Town Council of £40,000 for electric lighting purposes.

The St. Helens Town Council has applied to the Local Government Board for sanction to borrow £16,500 for additional electric lighting plant.

The Darlington Town Council intends spending £14,000 for gasworks purposes, including the purchase of meters and stoves, and the laying of additional mains.

A Local Government Board inquiry has been held at Beckenham, with reference to the application of the Council to borrow £20,000 for the extension of the electric light.

At a recent meeting of the Whitehaven Town Council it was agreed to make an offer to the District Council to supply Parton with water at 6d. per thousand gallons, with a minimum payment of £100 per annum.

A Local Government Board inquiry has been held at Hoylake regarding an application by the Hoylake and West Kirkby District Council for permission to borrow £13,500 for the extension of electric lighting works and cables

A new gas light was introduced into Scarborough for the first time last week. The new machine is the patent of Mr. William Sugg. A lamp has been fitted with three of Mr. Sugg's new patent incandescent burners, which, by means of his machine, are supplied with high-pressure gas at 9in. (column of water). The consumption of the lamp is 30 cubic feet per hour, or 10 cubic feet each burner, and the light given is equal to 1000 candles. This result is obtained by raising the pressure of the gas ordinarily supplied by the gas company from, say, 2in. to 9in. pressure at the foot of the burner in the lamp by means of a small hydraulic ram, fixed in some convenient position to supply any number of lights. This ram is actuated by the water from the street main at a pressure of about 30 lb. to 60 lb. on the square inch. It is connected to a pump very much larger than itself, into which gas is taken from the service and forced up to the pressure required.

THE Notting-hill Electric Light Bill has been read a third time in the House of Commons.

AN inquiry was held at Newark last week with reference to the proposal of the Town Council to borrow £30,000 for electric lighting purposes.

THE Malvern Urban District Council has decided to borrow £17,000 for the installation of electric lighting and the erection of a refuse destructor.

AT a recent meeting of the Yarmouth Town Council it was stated that there was a deficiency of £751 on the past year on the electric light undertaking.

THE directors of the Commercial Gas Company notify that the price of gas will be reduced from 3s. to 2s. 8d. per 1000 cubic feet after this midsummer.

THE Shrewsbury Gas Bill, which has passed the House of Lords, came last week before Mr. Lowther (Chairman of Committees of the House of Commons). The Bill seeks power to confer further powers on the Shrewsbury Gas Light Company, with the object of meeting the demands of the district for an increased gas supply. There was no opposition, and the necessary proofs having been given, the Bill passed the Committee stage, and in due course will be reported for third reading.

THE official inauguration of the electric light supply at West Kirby and Hoylake took place on Saturday, the 8th inst. The function in itself was not an imposing one, but the lunch afforded an excellent opportunity for the members of the Council to belaud each other, and they did it with effect. The Chairman (Mr. G. Wall), after giving some figures, indulged in a sanguine forecast of what will take place now that electric light is available, which many hope may be even partially realised.

AT a recent meeting of the Electric Lighting Committee of the Beckenham District Council it was decided to recommend that the Clerk be authorised, on behalf of the Council, to sign agreements for the laying of new cables in the requisition of inhabitants, all applications for extensions of cable to be first submitted to the Committee for approval. The Committee was of opinion that it was advisable to extend arc lighting in main roads as soon as the new machinery (on order) rendered such extensions possible. The report was adopted.

THE question of dealing with the surplus of £2000 left over after paying the shareholders of the North Bierley Gas Company on the terms agreed upon between the company and the Bradford Corporation has been considered at a meeting of the directors and shareholders at which Mr. A. B. Moorhouse presided. It was moved by Mr. Wilson, of Great Horton, and seconded by Mr. Mitchell, of Little Horton, that the amount be given to the directors as an honorarium for their past services. This motion received little support, and it was then resolved to divide the money equally among all the shareholders.

THE Town Clerk of Ripon, at the request of the Corporation Gas Committee, has sent to the members of the Council a copy of the annual gas report and accounts prepared by the Deputy Town Clerk and Manager. During the year ending March 31st, 1901, the quantity of gas made at the works was 39,500,000 cubic feet, a decrease on the previous year of 500,000 feet; the gas sold being 30,921,930 feet, a decrease of 968,510 cubic feet. The quantity of coal carbonised was 4618 tons, which yielded on an average 8554 cubic feet of gas per ton; the gas sold being equal to 6696 cubic feet per ton, showing a leakage of 16·5 per cent., the same as last year. Part of the leakage was owing to the laying of new mains, the bad condition of the old holder, and condensation. No cannel coal was used. From the balance sheet it appeared that the loss after paying sinking fund and interest amounted to £1093 7s. 7d.; and exclusive of sinking fund and interest the profit was £89 7s. 3d. The sum of £1118 8s. 3d. was due to the treasurer on the gas reserve fund account. The loss on the total contracts rejected by the Council in February, 1900, amounted to £575 for coal, and £110 13s. extra cost of labour and storage, in consequence of the altered conditions of the delivery in the new contracts.

GENERAL.

THE Newbury Corporation contemplates the erection of a hospital for cases of infectious disease.

THE Stretford Urban District Council has decided to erect baths at Old Trafford, at a cost of £12,500.

AN inquiry was held at Warrington last week with reference to a proposed loan of £7000 for the extension of the public baths.

THE Stepney Borough Council has resolved to apply to the London County Council for £9000 towards the cost of widening Narrow-street, Limehouse, which work is in progress.

A LOCAL Government Board inquiry was held at Swansea last week with reference to the applications of the Corporation for sanction to the borrowing of £425 for public conveniences, £286 for street improvements, and £50 for slaughter-house purposes. After hearing the evidence the Inspector visited the sites.

AT its last meeting the Birkenhead Town Council approved the recommendations of the Tramways Committee to borrow £11,101 for providing double tracks in place of single tracks on certain sections, £13,000 for fifteen additional cars, £7500 for extra generating plant, and £1000 for repairing plant at the North End depôt.

COLONEL LUARD held an inquiry at Warmley last week with respect to an application of the Warmley Rural District Council for sanction to borrow £2000 for works of street improvement in the parishes of Mangotsfield and Oldland, and for the powers conferred upon Urban Authorities by Section 154 of the Public Health Act, 1875.

THE Camberwell Borough Council has decided, upon a report from Dr. Bousfield, its bacteriologist, to sanction the purchase of a small gas engine at a cost not exceeding £40, for use in mechanical work connected with the detection of tuberculosis in milk, especially condensed milk. Dr. Bousfield proposes to test the milk sold in the borough.

AT the last meeting of the Grimsby Sanitary Committee, a Sub-committee presented a scheme for the provision of a refuse destructor. The cost had been estimated at £10,500, and the Committee recommended that the tender of the Horsfall Company, of Leeds, for the erection of a destructor, &c., at a cost of £8507, be accepted. This was adopted.

THE Sanitary Committee of the Derby Town Council has decided to recommend the Corporation to adopt Part 3 of the Housing of the Working Classes Act, 1890. The Act enables Corporations to acquire land on which they can build lodging-houses for the working classes. Its adoption has been urged by sanitary reformers in Derby for some time past.

THE Vaccination Officer for the Poplar union informs his Board of Guardians that until the present time he has been able to avoid taking extreme measures to secure compliance with the Vaccination Acts, but that owing to the persistent activity of those who take exception to the Acts, it will be impossible for him to go further without making an example of a few of the strongest opponents of vaccination.

A SERIES of experiments with the Marconi system of wireless telegraphy are at present being undertaken between the school ship Conway and the Cunard Royal Mail steamer Lucania. The experiments are being regarded with great interest by members of the nautical profession, and the parents of the cadets on the Conway will have the satisfaction of knowing that an effort is being made to keep their sons up-to-date in nautical knowledge.

AT the last meeting of the Finsbury Borough Council the Public Health Committee reported that the Medical Officer of Health had drafted a circular directing the attention of the milk dealers of the borough to the necessity of keeping a register of the sources of their milk supply, and of obtaining guarantees from farmers that no infectious disease existed at the farms or in the homes of those engaged thereon. It was decided to ask the Local Government Board to approve of the circular.

PERSONAL.

Mr. Greig has been appointed Borough Electrical Engineer for Bury St. Edmunds.

Dr. Babet has been reappointed M.O.H. for Willington Quay for the ensuing three years.

Mr. Wilson, of Hampstead, has been appointed Assistant Inspector of Nuisances for Enfield.

Dr. Wigham has been appointed Borough Medical Officer of Health for South Molton.

Mr. D. Ellison, of Darwen, has been appointed Assistant Borough Surveyor for West Bromwich.

Mr. T. Bradshaw, of Manchester, has been appointed Inspector of Nuisances for Dorchester.

Mr. F. W. Enrich has been appointed Pathologist and Bacteriologist to the Bradford Corporation.

Mr. H. B. Miller, Town Clerk of Yarmouth, has been appointed as Town Clerk of Norwich.

Mr. R. W. Woods has been reappointed Inspector of Nuisances for the rural district of Northampton.

Dr. W. Gruggen has been unanimously reappointed Medical Officer of Health for Tring for the ensuing year.

The Local Government Board has approved the appointment of Mr. Thompson as Inspector of Nuisances for Ripley urban district.

The Droxford Rural District Council has increased the salary of its Sanitary Inspector, Mr. Robert Johnson, by £35 per annum.

Mr. J. Young, of Shanklin, has been appointed Inspector of Nuisances and Town Inspector for Shanklin, at a salary of £90 per annum.

Mr. W. N. Blair, County Surveyor, has been reappointed Borough Engineer and Surveyor of St. Pancras, at a salary of £700 per annum.

The Local Government Board has authorised the reappointment of Dr. H. C. Sharp as Medical Officer of Truro, at the usual salary, viz., £50 per annum.

Mr. J. E. Walker, of Hunstanton, has been appointed Surveyor, Sanitary Inspector, and Water Bailiff for the urban district of Ledbury, at a salary of £75 per annum.

Mr. F. A. Channing, M.P., proposes to introduce a Bill providing that no prosecution under the Vaccination Acts shall be commenced without the authority of the Guardians.

LAW CASES.

An Insanitary Dwelling-house.

An extraordinary state of affairs was disclosed in Edinburgh Police Court, when Dr. A. M. Williamson, Chief Sanitary Inspector, appeared as a witness in a case at his instance against Mrs. Diana Hargrave Wardlaw, 22, Royal-crescent, for having accumulated within her dwelling-house a quantity of filth, dirt, and offensive matter. The accused pleaded not guilty.

Dr. Williamson stated that he visited the house on the 10th of this month, and, without exception, he considered it to be the filthiest place he had ever been in. The dining-room and the room to the front were simply littered with rubbish, ashes, &c., which in some places was almost knee-deep. Every one of the cupboards was packed full of chaff and filth. It seemed to him to be the collection of years. The place was a perfect rubbish toom. In his opinion there was a great risk to all the citizens who lived in the immediate district. So bad was the place that he had been compelled to call on the accused to clean the house. The landlord sent a cart to remove the rubbish, but the accused sent the cart away.

The accused said that she was in the middle of spring cleaning, and had not managed to get the rubbish cleared away. She denied that a rubbish cart had been sent to her house. In one of the rooms, she admitted, there was a bundle of fish, which sent out such a strong odour that Dr. Williamson walked about with his handkerchief at his nose. (Laughter.)

Dr. Williamson intimated that he was anxiously awaiting the conclusion of this case in order to proceed with another prosecution.

The accused exhibited a cool indifference to the proceedings, and smiled while Dr. Williamson related his sensational story.

Bailie Telfer imposed a fine of £2, the alternative being ten days.

A Lodging-house Keeper's Conviction.

Bernard McGhie, lodging-house keeper, Paisley, was charged at the instance of the Paisley Town Council with having failed to fill up certain schedules as required by an order of the magistrates. The facts were that during the prevalence of the small-pox epidemic in Paisley last spring, about the month of February, the Public Health and Slaughter-house Committee of the Paisley Town Council issued an order that the keepers of every common lodging-house in the burgh should be required from time to time to report to the Sanitary Inspector every person who resorted to their houses on the preceding day and night, and they were to be furnished with schedules for this purpose. These the accused had neglected to fill up. He was convicted and fined £1. An appeal having been taken to the High Court of Justiciary, on the ground that the schedules were not in terms of the statute, that it was *ultra vires* of the Local Authority to demand the information and on other technical grounds, the appeal was dismissed, the Lord Justice Clark remarking that a more hopeless appeal he had never seen.

NOTES AND QUERIES.

Subscribers may obtain advice on matters appertaining to Public Health Law and Municipal and Sanitary Engineering. Letters should be addressed "Notes and Queries," The Sanitary Record, 5, Fetter-lane, London, E.C. If an answer be required immediately, a stamped addressed envelope must be enclosed

2237.—Isolation Hopsitals: Book on.—"R. H. H." writes:—"I am desirous of obtaining the latest up-to-date work on the construction and management of isolation hospitals. I have Dr. Thorne's book, Report to the Local Government Board on "Infectious Diseases Hospitals." What other books would you recommend?"

Answer.—There are very few books published on the subject of infectious hospitals. The only other book we can recommend beyond that mentioned by the querist is Burdett's "Cottage Hospitals, General Fever and Convalescent," price 10s. 6d. post free from the office of this journal.

2238.—Bakehouse: What is Drain Opening therein?—"Constant Reader" writes:—"I enclose rough sketch of bakehouse which has been reported as having two drains in it for the purpose of carrying off slop water, and a notice has been served on the owner to remove the drains. Would you please advise whether the drains are, in your opinion, within the bakehouse?"

Answer.—From the sketch submitted the drain openings are not within the bakehouse, but are each in the area outside the bakehouse. The Authority could not succeed in proceedings for the removal of the gullies in question.

2239.—Housing of the Working Classes Act: Closing Order.—"F. T. C." writes:—"This Urban Authority had a certificate from their Medical Officer of Health that a certain dwelling-house was unfit for human habitation, and a resolution was passed that proceedings should be taken for the purpose of closing same. At the same meeting the Sanitary Inspector asked for a statutory notice to be served on the owner of four houses to put the same in a habitable condition, and a resolution was passed authorising same to be served. The whole of the said five houses form one block. The statutory notice has been served on the owner with regard to the house certified by the Medical Officer of Health for the same to be put in a habitable condition. Please advise whether proceedings could be taken for the express purpose of closing the house without the above

notice being served by the Clerk? I may add that no previous notice had been served on the owner."

Answer.—The proper procedure is first to give notice to the owner or occupier to execute the work necessary to put the house in proper condition. Then, if the owner makes default, or if the nuisance is likely to recur, the Local Authority may summon the owner or occupier before the Justices, who may make a closing order. See Allan's "Housing of the Working Classes Acts" (second edition), price 7s. 6d., obtainable from the office of this journal.

2240.—HORSEFLESH SOLD AS HUMAN FOOD.—"E. T. M." writes:—"A butcher has purchased horseflesh from a knacker's yard and sold the same as beef. Could proceedings be instituted against the knacker for selling the same to the butcher? The difficulty lies in the fact that the butcher lives in an urban district and the keeper of the knacker's yard in a rural district. The butcher will be prosecuted by the urban district. I am anxious to know whether this Urban Authority can prosecute the knacker as well, either for selling meat known to be horseflesh without being labelled as such, or for selling unwholesome meat."

Answer.—In our opinion the Urban Authority will not be enabled to successfully institute proceedings against the knacker. The sale to the butcher does not appear to have been made within their district, but in the district of the rural Sanitary Authority, and the latter authority (if any) should institute proceedings against the knacker.

2241.—HOUSE DRAINAGE: MAKING JUNCTION OF HOUSE DRAIN WITH SEWER: WHOSE DUTY.—"D. L. O. G." writes:—"When owners of property require to connect their drains with the public sewer, will you kindly advise as to whose duty it is to excavate the ground around the sewer sufficient to fix a junction pipe for the drain? I may say that I am of opinion that it is the Council's duty to fix and prepare junctions for private drains, but my co-officer and some of the councillors differ, and say the ground around the sewer should be excavated by the owner, and the Council's duty ends with fixing the junction."

Answer.—The querist is wrong. It is not the duty of the Council to excavate any part of the ground around the sewer for the purpose of fixing the junction. Neither is it compulsory on the Authority to provide a new junction for each connection. It is, however, a general practice for Local Authorities to do so, so as to ensure that the sewer is not damaged by unskilful workmen. Many authorities, however, charge owners a fee to cover the cost of labour and materials for the work.

2242.—BUILDING LET ON REPAIRING LEASE: NOTICE UPON WHOM TO BE SERVED.—"E. R." writes:—"Your opinion is asked as to who, under the following circumstances, is liable to repair a defective outdoor water-closet, viz., A lets a house to B at a yearly rent, an agreement having been made that A will keep the outside of the premises in good repair and order, B undertaking to keep the inside in good condition. The agent of A declines to do anything to it, and maintains that B is liable?"

Answer.—The Sanitary Authority must follow the procedure prescribed by the Act, and serve upon A (the owner) who is the person liable. It is not the province of a Sanitary Authority or their officials to recognise private agreements. The Act prescribes that notice must be served upon the owner when structural defects are to be remedied, and the officer has no business to recognise such an agreement as that referred to. Moreover, B is not the owner, and a notice served upon him would be invalid.

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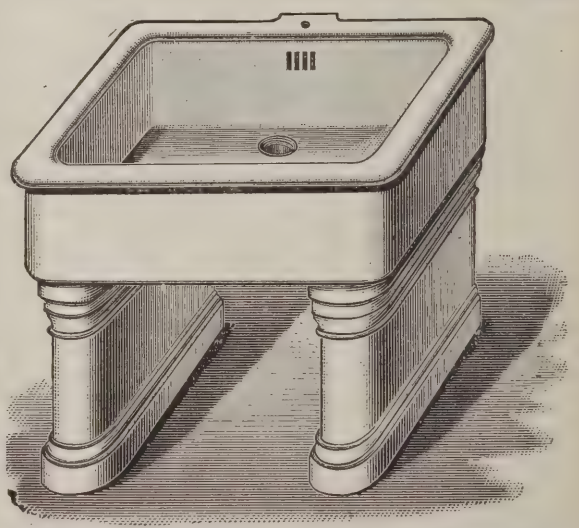

J. & M CRAIG, Ltd., KILMARNOCK

PUBLIC LIGHTING BY GAS & ELECTRICITY

By W. J. Dibdin, F.I.C., F.C.S.,
Late Chemist and Superintending Gas Examiner to the Metropolitan Board of Works and the London County Council.

(*Continued from page* 425.)

CHAPTER XIX.—EFFICIENCY OF ARC AND INCANDESCENT LAMPS.

The intensity of various arc and incandescent lamps was formerly greatly exaggerated. For instance, in many cases three or four hundred candle-power lamps were calculated as being equal to a thousand candles. This error was soon corrected by the results of the photometrical experiments made by the writer under the direction of the Metropolitan Board of Works in connection with the Thames Embankment experiments with the Jablochkoff arc lights.

The following extracts from the report of Sir Joseph Bazalgette, the engineer, and Mr. T. W. Keates, the chemist to the Board, form an interesting and valuable contribution to the photometry of the arc lamp, as the principles there involved are still those concerned in all similar installations.

* In consequence of the dazzling nature of the electric light, and its tendency to injure the sight of persons exposed to its influence, it is necessary that the naked light should be screened. Opalescent glass globes have been used by the French society both in Paris and in London, and these have been in use on the Embankment, with the exception of one lamp, from first to last. The effect of this opalescent glass is to soften and diminish the light, so that it is possible to look fixedly at the globe without any distress, but at the same time the available light is lowered to a very great extent. A different kind of globe, having a frosted surface, has been used for some time under the Hungerford Railway Bridge; this globe stops much less of the light than the opalescent glass.

A number of experiments was made at the machine house on the Embankment, where a complete photometer was fitted up. These experiments were (1) upon the naked light, (2) upon a light with opalescent globe, (3) upon a light with a frosted globe. The measurements were made horizontally in each case.

In every experiment the electric light was placed 240in. from the measuring light, and the photometer screen moved between them, a star disc being employed in consequence of the difference in the colour of the lights, precluding the use of the ordinary greased Bunsen disc.

Twenty readings or observations were made in each experiment, both with the open and shaded lights. Eight experiments were made on as many different nights. The following are the results obtained :—

Naked light	378·1 sperm candles
Opal globe	154·9 sperm candles
Frosted globe	265·0 sperm candles

The light passed by the opal globe was, therefore, equal to 59 per cent.; by the frosted globe only 29·9 per cent. These results show the effect of enclosing the electric arc by globes, and serve as useful guides to indicate the loss of light resulting in all similar cases.

When the arc lamp was introduced on the Thames Embankment in 1879, some experiments were made at the suggestion of the writer to ascertain the effect of enclosing the carbons in closed glass vessels, with a view to reduce the rate of their oxidation. The peculiar action of the Jablochkoff "candle," however, was not favourable to the method, an undue amount of deposit appearing on the surface of the glass, with the result of largely reducing the effective power of the light. Later on, when the improved forms of the Brush and similar lamps were introduced, further trials were made by the writer in conjunction with Mr. de Segundo, with most satisfactory results, it being found that the life of the carbons could be prolonged up to as much as ten times, but at this rate the character of the arc was not so satisfactory, as a carbon button formed on the negative carbon, with a consequent dimming of the light. When a slow stream of air was allowed to enter the small encircling glass pear-shaped vessel surrounding the arc, just sufficient in quantity to oxidise the particles of finely divided carbon as they were carried from the positive to the negative carbon, the light remained perfectly steady and of the original intensity. The following are some typical results of the experiments thus made :—

Time.	Length of carbon in arc lamp No. 1 without economising globe. Inches.	Length of carbon in arc lamp No. 2 with economising globe. Inches.
12.00	2·21	1·18
12.10	2·43	1·23
12.20	2·61	1·32
12.25	2·75	1·40
12.35	2·81	1·42
12.40	3·00	1·50
12.50	3·19	1·54
1.00	3·40	1·62
1.45	4·21	1·98
2.15	4·71	2·25
2.25	4·88	2·26
2.53	5·31	2·42
3.23	5·81	2·60

Relative Consumption.

Without apparatus, 12.00 o'clock to 3.23 ... ... 3·6in.
With " " ... ... 1·42in.

$$\text{Saving } \frac{(3\cdot6 - 1\cdot42)\,100}{3\cdot6} = 60 \text{ per cent.}$$

Time.	Length of carbon in arc lamp No. 1 without economising globe. Inches.	Length of carbon in arc lamp No. 2 with economising globe. Inches.
12.40	1·50	·97
12.50	1·97	1·08
1.40	2·61	1·30
1.50	2·80	1·35
2.10	3·14	1·47
2.35	3·50	1·60
2.40	3·60	1·62
2.50	3·76	1·68
3.00	3·91	1·75
3.15	4·18	1·82
3.25	4·30	1·90
3.35	4·43	1·93

Relative Consumption.

Without apparatus ... ... 2·93in.
With apparatus ... ... 0·96in.

$$\text{Saving } \frac{(2\cdot93 - \cdot96)\,100}{2\cdot93} = 67\cdot2 \text{ per cent.}$$

Time.	Length of carbon in arc lamp No. 1 without economising globe. Inches.	Length of carbon in arc lamp No. 2 with economising globe. Inches.
3 40	2·1	·85
3.50	2·2	·90
4.00	2·4	·99
4.10	2·53	1·04
4.20	2·60	1·13
4.30	2·85	1·21
4.40	3·00	1·30
4.50	3·13	1·40
5.00	3·29	1·50
5.10	3·40	1·60
5.20	3·59	1·70
5.30	3·75	1·78
5.40	3·90	1·85

* "Report on Experiments with the Electric Light on the Victoria Embankment." By Sir J. W. Bazalgette, C.B., Engineer, and T. W. Keates, Consulting Chemist, Metropolitan Board of Works, May, 1879.

Relative Consumption.

Without apparatus ... ... 1·8in.
With apparatus ... ... 1·0in.

$$\text{Saving } \frac{(1{\cdot}8 - 1{\cdot}0)\,100}{1{\cdot}8} = 44{\cdot}45 \text{ per cent.}$$

Time.	Length of carbon in arc lamp No. 1 without economising globe. Inches.	Length of carbon in arc lamp No. 2 with economising globe. Inches.
11.50	4·32	2·00
12.00	4·50	2·05
12.10	4·69	2·12
12.20	4·85	2·13
12.30	5·00	2·19
12.40	5·15	2·20
12.50	5·30	2·25
1.00	5·49	2·29
1.10	5·54	2·31

Relative Consumption.

Without apparatus ... ... 1·22in.
With apparatus ... ... 0·31in.

$$\text{Saving } \frac{(1{\cdot}22 - 0{\cdot}31)\,100}{1{\cdot}22} = 74{\cdot}6 \text{ per cent.}$$

Just as these results had been arrived at by a course of laborious photometrical and electrical testings, it was ascertained that patents had been secured in England and America for precisely the same method. The system is now in use in the form of the Jandus lamp, the special features claimed for it being that one pair of carbons consuming 4 ampères will last for about 200 hours without any attention whatever; with 5 ampères for 130 to 150 hours, and with 6 ampères from 100 to 120 hours.

(*To be concluded.*)

SANITARY LAW (A).*

By Trevor Edwards, Esq., West Riding Solicitor.

THE PUBLIC HEALTH ACT, 1875, AND THE MODEL BYE-LAWS THEREUNDER.

(*Concluded from page* 538.)

Thirdly—Powers of entry upon private premises.

The following are the sections dealing with the subject:—

Section 41. To examine a drain, water-closet, earth-closet, privy ashpit, or cesspool, on complaint of any person to the Local Authority of a nuisance.

Section 85. To inspect a common lodging-house.

Section 98. To carry out an order of the Court for abatement of a nuisance when the person upon whom the order has been served has failed to observe it.

Section 102. To examine generally as to the existence of any nuisance.

Section 119. To search for unsound food on a Justice's warrant.

Section 137. To enter upon premises and vessels to execute or superintend the executing of regulations of the Local Government Board relating to epidemics.

Section 169 (by incorporating the Towns Improvement Clauses Act, 1847). To inspect slaughter-houses.

Section 305. To execute certain works necessary to carry out the purposes of the Act.

This last section is, you will find, divided into three or four distinct parts. I commend it to you for discriminating perusal.

We all find in the humdrum of daily life that the act often repeated drops in our minds to common routine and loses the halo of heroism that would attach to it if it were performed once or at long intervals. This is your danger, and you must resist it, and the thought that you are safeguarding human life and not so much removing disagreeables may assist you in this. If you fail to maintain your duty at its high level, the ideal of your work will become so commonplace that you will discharge it only perfunctorily, and you will have ceased to be the trusty custodian of your high charge.

From my knowledge during the past ten years of the development of sanitary work in the Riding, and of the work of the two eminent County Medical Officers of of Health, Dr. Whitelegge and Dr. Kaye of that period. I have no doubt that, as means are afforded to our army of sanitarians, they will lay hold of the same; and as years go by, the result of their work will be a much lower death-rate and universal house and personal cleanliness.

* Third Lecture delivered to the Health Officers of the West Riding of Yorkshire April 27th, 1901, at the Philosophical Hall, Leeds.

QUESTIONS.

Q.—Does a nuisance arising from the noise of a feast or fair come within the province of an Inspector of Nuisances?

A.—An Inspector of Nuisances is not concerned with such a nuisance in the execution of his duties under the Public Health Acts.

Q.—In a long row of houses belonging to one owner, a slop-water closet is blocked, and in consequence a serious nuisance is caused by the sewage damming over surface of yard. Who is responsible for the abatement of the nuisance—the owner or occupiers? If occupiers, which, as there are persons from two houses attending the water-closet?

A.—The occupier is liable, unless the nuisance arises from the defective construction of the water-closet, when the liability falls upon the owner (Section 94). If the nuisance arises from the acts or defaults of the occupiers of two houses, proceedings may be taken against either or both (Section 255).

Q.—Has an Assistant Inspector (in the absence of his chief and Medical Officer) power to seize unsound meat, &c.?

A.—On the wording of Section 116 of the Public Health Act, 1875, this power is restricted to "any Medical Officer of Health or Inspector of Nuisances." The power cannot apparently be exercised by an *Assistant* Inspector in the absence of the Medical Officer of Health or Inspector of Nuisances.

Q.—If an Assistant finds an unsound or diseased carcase of meat and leaves it in order to communicate with his chief or Medical Officer of Health, and the owner disposes of it in the interval, does he render himself liable to be dealt with under the provisions of Section 118 for obstruction?

A.—No.

Q.—Would the finding of a diseased carcase of meat inside a slaughter-house (not exposed for sale) subject the owner of such carcase to a legal penalty?

A.—The Towns Improvement Clauses Act, 1847, which is incorporated with the Public Health Act, 1875, empowers an Inspector to enter a slaughter-house and seize any carcase found there which appears unfit for the food of man without regard to the question whether it is intended for sale or not. If the meat is subsequently condemned and an order made for its destruction the owner is liable to a conviction.

Q.—Can an Inspector go into a private house if he knows that unsound meat is going to be used by the inmates—say workpeople? Is the occupier liable to a penalty?

A.—The powers of inspection and seizure of unsound meat given by the Public Health Act, 1875, can only be exercised (except as to slaughter-houses) in respect of meat or food intended *for sale* or for the food of man.

Q.—Would it be legal for a Justice of the Peace to give an order for the destruction of diseased meat upon

the certificate of a Medical Officer of Health, or Inspector of Nuisances, he (the Justice of the Peace) not having seen the meat?

A.—In my opinion, the Justice must see the meat before he can make any order.

Q.—Can a Local Authority require an owner of a cottage property to erect a ventilating pipe on his property, which will only ventilate the public sewer when the drains from each are connected directly to the sewer? (Public Health Act, 1875, Section 19.)

A.—No.

Q.—Some time ago a drain passing under a building was found to be choked, and when opened was found to receive the sewage from two other properties. Each of the owners contributed to the repair. The drainage of an adjoining owner is now found to require repair, and a sufficient fall cannot be got on his property. Can the Local Authority require him to connect his drains to the first-mentioned drain without the previous consent of the owners who had it repaired?

A.—As the first-mentioned drain receives the sewage of several properties, it appears to be a sewer, and is accordingly vested in the Local Authority. The adjoining owner, may therefore be required to connect his drain with the sewer, provided that it is not more than 100ft. from the site of his house, and the consent of the owners who repaired the sewer is not required. The order of the Local Authority will not, however, entitle the adjoining owner to enter upon private land to execute the work without the consent of the owner of the land.

Q.—Forty to fifty back-to-back houses, in detached blocks, extend along one side of a street. Some of the front houses are drained into the sewer in said street, but the sewage from the back houses, and many of the front ones, is discharged at the back of the houses on to the hillside, giving rise to a series of nuisances where the pipe drain from each block ends. Several owners are involved:—(*a*) Can the Local Authority require these owners to combine to make a drain for the whole of the properties and connect the same to a sewer which is more than 100ft. from the houses under Section 23; or (*b*) is it not the duty of the Local Authority to make a new sewer sufficient for effectually draining the district and connect thereto existing drains from the houses under Section 15?

A.—(*a*) No. (*b*) Having regard to the number of houses in question, I think there is a duty upon the Local Authority to make such sewers as may be necessary to receive the drainage of the houses.

Q.—In the case of several semi-detached villas, the drains of each villa are connected to a manhole in one of the gardens, and thence to a public sewer. Is this latter part a sewer repairable by the Local Authority, or a drain for which the owner is responsible?

A.—If the conduit from the manhole to the public sewer conveys the drainage of more than one pair of semi-detached houses, it is a sewer, and repairable by the Local Authority. I assume that Part III. of the Public Health Act (Amendment Act), 1890, has not been adopted. If, however, the conduit from the manhole conveys the drainage from one pair of semi-detached houses only, it is a drain, for the repair of which the owner is liable; it has been so decided in a recent case before the High Court.

Q.—Public Health Act, 1875, Section 24:—Can a Sanitary Authority compel an owner of houses to re-drain them into a new sewer which has been substituted for another previously serving the houses by reason of the latter becoming unsuited or not adapted to the general system of a district, and who should bear the expense?

A.—Section 24 provides that a Local Authority may require a house to be drained into a new sewer under such circumstances. The Local Authority are given the power to do the work at their own expense, but not to compel the owner to undertake it.

Q.—(*a*) Can an owner of property divert a sewer in street which has become vested in the Authority for his convenience without the permission of the Public Authority; and (*b*) which section in the Public Health Act, 1875, authorises the Authority to either directly sanction or decline such a diversion?

A.—(*a*) No. (*b*) Section 18 empowers a Local Authority to divert a sewer.

Q.—Is a Sanitary Authority bound by its own bye-laws?

A.—Yes, absolutely.

Q.—The Model Bye-laws having been adopted by an Urban District Council can the Council modify them by resolution? What should an Inspector do in order to protect himself if the Council do modify a bye-law—I mean if a Local Government Board Inspector complains?

A.—No, a bye-law can only be altered by a subsequent bye-law approved by the Local Government Board. The order of the Local Government Board prescribing the duties of an Inspector of Nuisances directs that he shall "observe and execute all the lawful orders and directions of the Sanitary Authority." The orders of the Local Authority which an Inspector is to carry out are limited, therefore, by that word *lawful*. A complaint by a Local Government Board Inspector should be referred at once to the Clerk of the Authority.

Q.—What is the reason for the omission in the Model Bye-laws of the Local Government Board of a clause making it impossible for a new house or houses to be erected without closet and ashpit accommodation?

A.—This is provided for by Section 35 of the Public Health Act, 1875.

CORRESPONDENCE.

(*To the Editor of* The Sanitary Record.)

(*We do not in any way hold ourselves responsible for opinions expressed by our correspondents.*)

NATIONAL HONOURS FOR PUBLIC HEALTH OFFICIALS.

Sir,—Your leading article on the above subject is both timely and *apropos*. At a time when honours are being freely lavished upon those who have distinguished themselves on the veldt, it is only fit and proper that attention should be drawn to the claims of fighters in another field—claims none the less honourable because the victories achieved have been bloodless. The conquests of empire carry in their wake the cry of the widow and fatherless, but the victories achieved by the noble army of Public Health workers is open to no such reproach.

It would seem that hitherto the martial spirit has blinded the eyes of our Government to any claims to distinction other than these associated with kharki. But while we honour the brave who have taken up arms for the defence of the Empire, let us not forget those who do battle with a far more insidious foe even than the Boers—those who wage incessant war against disease and rescue the rank and file of our slums from its devastating inroads. As the poet says—

"Peace hath her victories,
No less renowned than war."

I think the time has arrived when our legislators should acknowledge this much by bestowing at least a few honours on those who, if less in evidence to the naked eye than the man in kharki, are every whit as brave and deserving.—Yours faithfully,

Westminster S.W., June 23rd. M. P.

MUNICIPAL AND COUNTY ENGINEERS.

ANNUAL MEETING AT LEICESTER.

THE PRESIDENT'S ADDRESS, BY E. GEORGE MAWBEY, M. INST. C.E.

In very gratefully receiving at your hands the highest honour you can confer upon me, I fully appreciate and value this proof of the esteem and confidence of the Council and the members generally in unanimously electing me your President. I naturally feel proud of this compliment to the town and myself, and I shall earnestly endeavour to do all in my power for the advancement of knowledge and practice in the many branches of municipal engineering and the multifarious duties devolving upon us for the health, comfort, and well-being of our people, and also for the prestige and still further progress of the Association and the benefit of our members, and, in this, I know I shall have your loyal support and the assistance of all your representatives in office.

After twenty years' membership, and being installed your President at the first annual meeting of the new reign and of the twentieth century, I might have given you an exhaustive retrospect of the achievements and enormous strides in sanitary science and the important part taken in them by our profession and members during the great and glorious reign of our much-beloved late Empress-Queen Victoria (whose loss touched our hearts more deeply than can ever be expressed), but those subjects have been so ably dealt with, in admirable addresses by one or other of my eminent predecessors, that I propose to refer to them only briefly in taking up some of the most important questions of the present day affecting municipal engineers.

Vast and various as have been the enterprise, research, invention, and achievement throughout the British Empire during the Victorian era, the reign of our illustrious Sovereign, King Edward VII., bids fair to make a record of unparalleled advancement. This is, in many ways, a time of great promise, and from what has already transpired, we well know that his Majesty's most powerful efforts will be exerted in the encouragement and development of any good work or movement which will tend to promote and maintain the health and happiness of his people, as well as the peace and prosperity of our great Empire.

It is now fourteen years since our highly-esteemed *confrère* and friend—and my predecessor—the late Mr. Joseph Gordon, was installed your President in this room, and twelve years on the 9th November next since he was so suddenly taken from us at the very zenith of his power, so soon after he was elected Chief Engineer to the London County Council; and we have recently sustained another serious loss to our profession by the death of our very able and delightful *confrère*, Mr. W. Santo Crimp, in addition to others much missed, sad events which do not get erased from our memories.

In our volumes recording the successful meetings held here in 1884 and 1887, the works of Leicester are duly described, and at the autumnal meeting in 1893 I completed the record of Mr. Gordon's splendid work. Therefore, in connection with the subjects of general and universal interest upon which I wish to speak, I shall, in referring to Leicester works as practical examples, deal more particularly with what has been done here during the twelve years I have had the honour of being the Borough Engineer and Surveyor.

Few, if any, towns have shown greater enterprise and public spirit, or have made greater progress in recent years. The population, twelve years ago, in 1889, was 138,000. In 1891, when our Borough Extension Scheme was promoted and won, it was 174,624. At this 1901 census it had risen to 211,574—an increase of 29·5, 21·16 per cent. in the decade. The rateable value in 1889 was £522,309; in 1891, after the extension, £649,583; and it is now £841,301—an increase of 29·51 per cent. in the decade. In the twelve years, 41¼ miles of new streets have been made and sewered on the duplicate system, bringing the total length of streets and roads up to 178 miles, against 76 miles before the extension of the borough. Plans have been approved since 1889 for 15,535 dwelling-houses, 167 warehouses, 179 factories, 313 workshops, 314 special buildings, 10,968 miscellaneous alterations and additions, new drains, &c., and for 386 new streets, the whole covering over 500 acres of additional built area, and involving an expenditure of (very roughly speaking) about £7,000,000 sterling, which speaks with a peculiar eloquence of the progressive commercial prosperity of the town.

During this period Local Government Board inquiries have been held upon 226 subjects affecting my department, for new works and improvements, involving the expenditure of about one and a-quarter millions sterling, and I have, at the present time, for this Corporation, schemes in hand representing a cost of nearly a million sterling, for most of which the loans have not yet been obtained, and the routine expenditure by the various committees in matters affecting my office amount to about £80,000 per annum. Regarding our every-day work, I cannot speak too strongly on the great necessity — as one of the best practical means of safeguarding the health of the community — for Local Authorities being liberal in providing an adequate number of well-qualified and properly-remunerated Building and Sanitary Inspectors, working under able administration.

The good effect of the great sanitary works and efforts of this Corporation is vividly shown by the steady and maintained diminution of the death-rate. The average from all causes during the decade of 1861-71 was 25·95; 1871-81, 24·47; 1881-91, 19·38; and during the last decade to 1901 only 17·54.

With regard to the designing of the various classes of public buildings, in some towns a separate architectural department has been organised. In Leicester the ordinary architectural work is done by my staff, and the most important public buildings by our architects in private practice. Nevertheless, in connection with all these, an immense amount of preliminary work necessarily falls upon the Borough Engineer in advising and assisting various Committees, preparing preliminary plans and estimates with detailed conditions for competitors, and outlining the schemes before the work reaches the architects. This is, however, I think, a far preferable plan than to set up an architectural department outside the control of the Borough Engineer, and much more fair to the architectural profession.

Referring, in passing, to other departments, the town owns the gas, electric light and water undertakings, and parliamentary powers have been just recently obtained jointly with Derby, Nottingham, and Sheffield for carrying out the great Derwent water scheme. Since 1889, 120 miles of public and private foul and storm-water sewers have been laid in the borough. Mr. Gordon's intercepting sewerage scheme and pumping station has been carried out at a cost of about £163,000, and has proved very successful; and my storm outfall scheme, which many of you saw in progress, and which has cost about £80,000, has also been completed. It is, however, one regrets to say, not unusual for municipalities, after having provided ample intercepting sewers, to leave in use in old and densely-populated parts of the town defective and dangerous sewers of the worse type, such as used to be designed and laid before the days of our Association.

Several years ago I drew attention to the existence of many miles of such sewers in Leicester, and the probable ill-effect upon the inhabitants living in those districts. I was promptly instructed to examine and report upon

them, with the result that I condemned thirty-two miles, and am now carrying out a scheme to replace them, which I have designed, and which is estimated to cost £128,000.

This brings me to the subject of sewer ventilation, and, although we have not yet arrived at an unanimity of opinion on this question, the chief trend of practice has been in the direction of the abolition or reduction in number of surface grids and the increase of shaft ventilation. In Leicester I carried out tests during a period of between five and six years, and made over 3000 observations of the velocities obtained in the shafts, besides very numerous records of temperature, humidity, wind, velocity, barometrical pressure, and the like. These practical experiments convinced me that sewers could be efficiently ventilated by pipe shafts alone in conjunction with very ample means of flushing.

After the results of these experiments had been submitted at an inquiry here, the Local Government Board passed the first section, namely, of eight miles of the before-mentioned tributary sewerage scheme, with ventilation provided by shafts without any surface grids whatever—a new departure in the requirements of the Board. No surface grids are now provided on any new public or private sewers laid down in this town.

The purification of sewage is one of the greatest and most perplexing questions that has confronted municipal engineers. Many have experimented, and there is still much difference of opinion. The investigations of the present Royal Commission on Sewage Disposal have already been very extensive, and will doubtless prove the most exhaustive and valuable research on record. Some think that the Local Government Board might now relax their requirements and pass schemes for bacterial treatment alone. This is not surprising, having regard to the success which has been obtained by bacterial methods. I have, however, maintained that until sufficient experience has been gained to prove that the sewage of the manufacturing towns can be successfully and permanently purified without application to land, the Board are justified, in the main, in adhering to their present attitude, for land is an immense safeguard in connection with any sewage scheme. Still, in cases where it is almost impossible, except at a prohibitive cost, to obtain it, I believe that the requirements of the Board might reasonably be modified. In fact, leniency has already been shown in special cases, and we may probably expect greater facilities when the eagerly awaited report of the Royal Commission has been issued.

Some of the main questions at issue are—(A) whether the sewage of manufacturing towns and districts can be successfully treated with maintained efficiency without application to land; (B) whether it is better to adopt the fullest anaërobic preliminary treatment in covered septic tanks with final purification in contact beds, or whether only to employ a partial anaërobic treatment in open or closed tanks with a maximum aërobic purification in contact beds; (C) further, whether preliminary chemical treatment may not also be necessary in some instances where strong trade liquids obtain. The question of intermittent or continuous treatment in the contact beds is also a debateable point, but the extreme aspect is whether, even where suitable land is available, it would not, if admissible, be more desirable to adopt bacterial treatment entirely than a combination of it and land treatment. Again, what is to-day the best course to adopt where existing sewage farms, for want of sufficient area, means of preliminary clarification or other causes, yield more or less unsatisfactory effluents?

The local conditions and the character of the sewage vary so considerably in different towns and districts that it is obviously impossible to determine upon any one system which would be universally applicable. These questions can, however, be more reliably dealt with by giving you facts as to how we have successfully solved the problem for Leicester than by mere expression of opinion. Twelve years ago, when I came here, and up to 1891, the river Soar in summer time was a black stream of horribly offensive sewage matter, which, in that highly putrefactive condition, reached miles down the river, although everything was done at unlimited cost, in chemical treatment at the old works.

In consequence of the difficulty of obtaining porous land in sufficient quantity and suitable locality, my predecessor had, much against his will and advice, to fall in with the adoption of our present exceedingly dense clay farm at Beaumont Leys, which it was widely prophesied would result in failure. The first contract, amounting to £10,400, for receiving tanks, carriers, culverts, &c., for part of the farm was well in hand when I succeeded Mr. Gordon. The total cost of laying out has been £59,025, or about £43·56 per acre for the 1355 acres actually prepared for receiving sewage.

The great problem, then, before us was how to so lay out, prepare, and under-drain the land for broad irrigation as to ensure efficient purification and to prevent the foul effluent, which always reaches the drains of a clay sewage farm, from getting away to the water-courses. This we succeeded in doing by providing for each field a separate system of drainage, so designed that the foul drain effluent can be brought on to the surface of the sloping land and treated over and over again until fit to send away. This, with other arrangements, together with the services of an exemplary committee and efficient farm bailiff, resulted in our dense sewage being purified for over nine years to the satisfaction of the Leicestershire County Council.

The increase of the population and the trade has been very great, and these factors, together with the conversion of 6700 pail closets into water-closets, and the proposal to pump the sewage from the 12,000 population of the added area of Belgrave, rendered it necessary to either increase the area of the farm or to adopt some means of preliminary clarification.

I have been allowed to carry out very extensive bacteriological experiments. Altogether seventeen different processes were tried, with two chief objects in view:—(1) The preliminary clarification of the sewage before application to old pasture land and ryegrass for final purification, without fouling the crops; (2) Complete bacterial purification without application to land. For preliminary clarification the system found most successful and suited to our requirements was to pass the screened and pumped sewage through a detritus tank of comparatively large capacity, then through a coarse-grained first contact bacteria bed on the intermittent system, the effluent therefrom being finished on grass. By this process eminently satisfactory effluents were uniformly obtained, notwithstanding the heavy nature of the land, and much less than half the land was required to be used than when crude sewage was applied. The final purification on the old pasture was at once a most reliable and effective process, and entirely free from offensive smell. The process for complete bacterial treatment which gave the best results was the passing of the screened and pumped sewage through the detritus tanks as before, then through treble contact beds, and the effluents from this process were only just equal to those obtained from the detritus tank, single contact and irrigation on grass land. The detritus tank and double contact process was not quite equal to either. These results were only determined by very numerous and exhaustive observations and analyses.

I consequently advised the Corporation to purchase 1270 acres of the land now leased to them, in addition to the 100 acres of freehold they already possess, and prepared a bacterial clarification scheme to assist the land, consisting of open detritus tanks with a capacity

equal to one-sixth of the present 8,000,000 gallons dry-weather flow to be dealt with, and 12 acres of first contact bacteria beds, which, together with the effluent pumping plant, new sewerage, and pumping station for the added area of Belgrave, is estimated to cost £168,000. This scheme has been unanimously adopted, and application has been made to the Local Government Board for sanction to borrow this amount.

Great inconvenience has been experienced throughout the country for want of a general Act of Parliament giving Local Authorities greater facilities for improving small rivers, brooks, and ordinary watercourses in their districts, particularly where improvement works necessary for the prevention of flooding of lands and dwellings are too small to justify the obtaining of a local Act of Parliament and too great to be defrayed out of the revenue account.

The flood which occurred at Leicester on the last day of the nineteenth century was the greatest here within living memory. Our great floods prevention works, which were mostly designed and carried out by Mr. Gordon and Mr. Griffith, and brought to a completion by myself at a cost of about £352,000, were constructed to carry off a volume equal to the whole of a rainfall of 1¾in. in twenty-four hours from the 147 square miles of drainage area, and the volume of the flow which was actually discharged and also successfully carried off during that flood was equal to a rate of rainfall of nearly 1¼in. in 24 hours. This is valuable and useful data in connection with the preparing of floods-prevention works.

I have recently designed and constructed in stone and concrete another bridge, besides those dealt with at your last meeting here, forming a new road from the Newarke over the flood course, at a cost of £15,500, which you will inspect, and I have prepared drawings and a description of it for our volume of "Proceedings." I am now designing a bridge to replace an old one of inadequate span at Belgrave, which will probably cost something approaching £25,000. I am quite unable to give you details of our different works in this address, but shall be pleased to supply later on any particulars which may be desired by you.

The rapid growth of large towns demands, for the sake of the health and vigour of all classes of workers with muscle or brain, for the children, and for those to whom we are so indebted for home comforts, that ample open spaces and conveniently-located parks and recreation grounds be provided. In Leicester we have now 410 acres of parks, recreation grounds, and children's playgrounds, altogether twelve in number, including our beautiful Abbey Park, which was opened in May, 1882, by our present King and his beloved Consort, and it has proved a great boon to the people.

Including the above, and the 1270 acres of land of the Beaumont Leys sewage farm now being purchased by arbitration, and the different estates, the Corporation will own altogether no less than 2442 acres of land and properties for various purposes, exclusive of gas and water, and so convinced are they of the advantages which would accrue, both in health and financially, with more power to acquire surrounding land, which is ever increasing in value, that they are far from satisfied with the facilities the present legislation affords.

The provision of public baths and open-air bathing stations is essentially an important health question, and there is now a tendency to combine water sports to a great extent with swimming, and to utilise the main buildings for gymnasia in the winter, with the maximum possible accommodation for spectators. Our Cossington-street baths are on this principle. We have now three public baths and two open-air bathing stations, and we are about to build another set, involving altogether an expenditure of about £50,000, exclusive of land. The last-mentioned baths are to be erected at the West Humberstone refuse destructor, from which the heat will be supplied. The swimming baths will be on the amphitheatre principle, with dressing-boxes under the seating, and, in lieu of the ordinary slipper baths, twenty-four combined washing and hot-vapour baths will be provided.

In electric traction for our streets and roads there is now opened out an immense field and future for municipal engineers. In conjunction with electrical engineers they have already played a very prominent part in the designing and carrying out of schemes in our large towns. There have been much greater enterprise and progress abroad than in this country, both in manufacture and construction, and from which we have derived much advantage; but all this is being rapidly changed, and to-day we possess, in some of our cities and towns, overhead-trolley systems, power stations, depôts, and various accessories of the very best types, with approximately about a thousand miles of electrically-equipped tramway track now in operation, mostly put down within the last decade, and several hundred miles are under construction. But perhaps nearly twenty times as much as this have been electrically-equipped in the United States, and a vast aggregate mileage throughout the Continent.

It was high time we moved. Foreign companies and capitalists are not only reaping the benefit of our traction trade, but are exploiting this country for the purpose of financing and carrying out tramway undertakings, which our countrymen, who in the past have been great pioneers in railways and other engineering works, ought, for the honour and prosperity of the kingdom, to rouse up and do for themselves, while at the same time encouraging and fostering such interchange of trade with other countries as is mutually advantageous.

Leicester, although usually in the front, is at present behind in electric traction, chiefly because the tramways are still in the hands of a company, but we intend to come into line, at least very soon. Although the overhead system has been chosen by every provincial town in the United Kingdom which has hitherto carried out a scheme, the objections to it have been so deeply rooted that a most exhaustive investigation has been made by us in the hope of finding something better, but we found nothing except the overhead trolley, which sufficiently combined reliability, safety, economy, and efficiency for a town like Leicester. We therefore recommended it, and also a separate and independent central power station.

Our preliminary scheme, which I had the honour of preparing for our Sub-committee, has been—by the full Committee—unanimously recommended to the Council, who have adopted it, subject to the site of the power station being in abeyance for the present, and I have been instructed to prepare the parliamentary and working plans, &c., for the scheme, with Mr. E. Manville as the consulting engineer. No detailed estimate has yet been prepared, but the present scheme embraces twenty-two miles of route and about thirty-eight miles of track, and, as to cost, half a million sterling is a guess which goes unchallenged, without including the purchase amount of the present undertaking.

I feel convinced that in provincial towns much more will be done to solve the question of the housing of the working classes by electric tramways than by the erection of blocks of workmen's dwellings in thickly-populated centres. Small separate dwellings, on the extreme outlying parts of a town, conduce greatly to the improved physique and respectability of the people, especially when allotment grounds are available within easy reach. We found that the experience in Brussels had been that it was not necessary to wait for the growth of a suburb before making a tramway, but that when a tramway is put down it makes a suburb, and that as unhealthy houses had been demolished in the centre of the city, the working classes gladly availed

themselves of the cheap and rapid tramway transit, and went out to the healthy dwellings which were soon provided, at reasonable rates, by private enterprise.

There is undoubtedly a great future for the autocar for light work and swift and convenient transit, and as greater perfection with regard to fuel, engines, gearing, and reduction of noise is attained, it will gradually effect a great sanitary improvement, and will considerably diminish the wear and tear of our roads and streets in comparison with horse traffic. Smart men will be their own drivers and mechanics, they can live long distances from their business, and can have their railway station in their own back yard.

Notwithstanding its great promise, the motor car is not likely, however, to supersede electric traction for public service, although very useful for feeders and auxiliary traffic. In the principal thoroughfares of large cities with electric tramcars, a one-minute service running each way is no unusual thing. This means something like 7000 persons passing a given point to and fro every hour, in an undeviating course, swiftly, smoothly, and almost noiselessly and without any confusion whatever, and even three or four times that number is quite practicable without inconvenience.

I wish here to take this, my earliest opportunity, of publicly thanking the members of the Automobile Club of Great Britain and Ireland, and of its Nottingham and Midland branches, for their great kindness in undertaking to bring their cars from different parts of the country to convey our members on their various visits in Leicester and the surrounding districts on Saturday. This excellent and unique event was kindly suggested to me by our *confrère*, Mr. E. P. Hooley, in conjunction with Mr. A. R. Atkey, honorary secretary of the Nottingham Club. The utility and advantages of motor cars will be practically demonstrated, and a great treat is expected. I therefore request your very hearty co-operation on that occasion.

I must not omit to draw your attention to the advance which has been made in steam road locomotion of late. For years past road locomotive engineers have devoted their energies to placing steam on common roads on a commercial basis. We well know that with heavy steam road locomotives the hauling of loads of from fifteen to thirty tons can be done at an extremely low cost per ton mile; but the new Locomotives on Highways Act, 1896, has produced a smaller and handier means of doing the work of several horses at an inclusive cost of less than 4d. per ton per mile. With regard to municipal work, several of the London and other Corporations are already using steam wagons for carting materials, watering streets, dust and refuse collecting, &c., and it is claimed to effect a considerable saving in cost.

What the future development of the steam wagon will be it is difficult to foretell, but the tendency will be towards simplicity of construction, higher quality of materials used, higher power of engines, increased pressure of steam, and greater economy. Nor are these light locomotives likely to increase the cost of upkeep of the roads themselves, for it must be borne in mind that with horse haulage, besides the pressure of the wheels bearing the load on the road, the deteriorating action of the hoofs of the horses must be taken into consideration. The present use of horseflesh for transporting more or less heavy loads, especially on steep gradients, is, in these days, hardly worthy of science.

One of the latest matters which we have to advise upon is the provision of short rifle ranges, similar to those at Wormwood Scrubs, which, it is urged, can be placed with safety within easy reach of every town or thickly populated district, and thereby give facilities for all our men to learn to shoot.

If such a voluntary training movement would, as some think, tend to so strengthen our nation as a fighting power, in case of need, as to substantially diminish the necessity for a very much larger permanent army, or to prevent the sacrifice of our sweet liberty by conscription, then every legitimate means towards this end might well be adopted by our Local Authorities. Our colleague, Mr. J. W. Bradley, having taken much interest in this subject, has kindly undertaken to read us a paper upon it.

The position of a municipal engineer is one of infinite variety of work and responsibility in so many branches of routine and professional duty, with a consequent strain far exceeding that brought upon his more fortunate and better paid confrère in private practice. Again, besides the unlimited theoretical and technical skill required, a successful municipal engineer must possess that peculiar power which enables him to organise and direct human effort to the best advantage, and to lead and control large numbers of men—qualities which are of superior value in every sphere of life—and it is to be hoped that Local Authorities will remunerate their own permanent engineers and surveyors to an extent fairly commensurate with their services, and thereby relieve them of the anxiety of the financial burdens brought upon them by their never ending professional education, the upholding of the respectability and integrity of their positions, and the meeting of the many claims for all sorts of objects, learned societies, &c., which their office demands, for I venture to say that many an able, exemplary, and frugal official is by no means free from such anxieties, simply because he is not adequately remunerated, although he does much extra work which would otherwise cost the ratepayers vastly more than would a reasonable increase of salary.

Security of tenure of office is a subject which has seriously exercised the minds of many, chiefly owing to unfortunate circumstances which, in several instances, have ended unfairly to the officers. It is, however, a delicate and difficult question, and, whilst some protection is needed, any attempt to restrict unreasonably the power of the Local Authorities would not tend to promote either the comfort or advancement of the officials. Superannuation for the officers of municipalities and Local Authorities generally is a question which I venture to respectfully say has by no means yet received at the hands of those Authorities the consideration it fairly deserves, although it must also be said that among the duly elected representatives of the ratepayers throughout the country it has many ardent advocates. Some towns, including Leicester, have obtained Parliamentary powers for local superannuation schemes, and some, including Liverpool, have adopted and worked them.

What is needed is a general Act, extending to all officers of Local Authorities the provisions of the Poor Law Officers' Superannuation Act. The present Local Authorities' Officers Superannuation Bill has been supported by several municipalities, but the Government will not adopt such a measure until the majority of Local Authorities have petitioned in favour of superannuation. This seems hopeless at present. The difficulty might possibly be partly met for a time by a measure giving each respective Authority the option of adopting the Act whenever they might become sufficiently convinced of the wisdom of such a step. The arguments in support of the justice of the case cannot be adequately dealt with in this address. I cannot leave this question without urging our members to support, as far as able, our admirable and much-needed orphan fund movement.

It would be almost impossible to overrate the extent to which our Association has improved the status of municipal engineers—largely by the great facilities afforded for the interchange of opinions and the obtaining of knowledge and information so willingly imparted by our members to each other in every sphere of their

work. Neither can one over-estimate the advantages accruing to Local Authorities from the experience gained by their officers attending our meetings and inspecting the numerous and varied works of our *confrères*, especially when one considers that a very large proportion of the sanitary works of the country have of late years been done by the stipendiary officials of municipalities.

Our Association, particularly by its examinations, has been the means of bringing forward many well-educated and clever young engineers into our ranks. I believe that the time is fast approaching when no young engineer will be considered duly qualified for a chief appointment who has not passed this or an equally comprehensive engineering examination. The profession and work of municipal and county engineers are of hardly less value and importance to the country than those of members of other leading professions, and our Association, with its roll of nearly 1000 members and graduates, representing practically the whole of the cities, towns, and districts of the United Kingdom and our Colonies, may be fairly entitled to equal recognition with all other prominent institutions. I think we might with advantage allow our list of eminent honorary members to be extended to admit more of the distinguished engineers and scientists of our country and of the continental cities and America, so as to facilitate to an even greater extent comparisons of practice and the promotion of knowledge in all branches of municipal work.

CLEANSING WORK IN ABERDEEN.

The annual inspection by the Town Council of the horses and carting plant belonging to the cleansing department of the city of Aberdeen took place last week. Councillor Glass, convener of the Cleansing Committee, dealing with the work of the department, read a statement prepared by the superintendent on the subject. A number of interesting statistics were presented in the statement. During the year 76,666 tons of refuse were collected from houses, shops, and streets. No fewer than 14,944,020 gallons of water had been distributed over the streets by the water carts, and 984,504 gallons were used to wash the streets. In view of the outbreak of small-pox in the country it was considered essential to adopt a more thorough system of street washing than was previously in vogue. The rotary brushes had swept 8610 miles of streets (apart from snowstorm work). The snowfall during the year was 37in., and the snow-rakes covered 5196 and the rotary brushes swept 2762 miles of streets, while 31,668 tons of snow were carted off the streets. The men on an average were on duty from 15 to 16 hours per day during the snowstorms, and £312 8s. was paid for hired horses, and £397 18s. 10d. for hired men. The income for hired work amounted to £4776. The stud numbered 87 horses, as against 83 at the same date last year. Sixteen horses were added to the stud during the year, and these were purchased at a cost of £923. The total value of the stud was £4250, being an average per horse of £48 17s. The cost of feeding and bedding was 11s. 7½d., as against 10s. 9d. for the preceding year, the difference being principally due to the increase in the price. The valuation of the stud and plant amounted to £9459 10s. 8d. Taking the years from 1893 to 1897 the total working amounted to £23,070 13s. 8d., and for the four following years to £23,350 10s. 1d., although during the latter period the work had been very considerably increased.

The Westminster City Council has decided to remodel the laundry at the Marshall-street Baths. The estimated cost is £4600.

THE VALUE OF ANALYSIS.

So many of our readers have to do with matters in which the analyst has to deal, that we think the following somewhat lengthy extract from an article in the *Engineer* on "Analysis by Experts" will be of interest. The exact position of the analyst has often been discussed, as also has been the exact value of his work. In the article quoted, an attempt is made to define these, with what success our readers must judge:—

There are numerous cases arising in daily commerce where the aid of the analyst is sought not so much for the actual figures which he can furnish but for the deduction which may be drawn from them, the object of attainment in the majority of cases which we have in mind being the imitation of the goods of a trade rival. Now there are many instances which could be cited where the more painstaking and accurate the analyst has been in his work, the greater has been the liability to false deductions on the part of him to whom the analysis was intended to serve as guide and mentor, and this has arisen from the statement of results emphasising the existence of bodies which are but accidentally present, *i.e.*, as impurities, in the bulk of the principal components.

Perhaps it will serve to make our contention clearer if we pass from the region of the abstract and take a concrete example, and one, moreover, of an admittedly complex type. A manufacturer of rubber packings for steam purposes, let us suppose, is anxious to know why it is that the material made by an opponent has a better name amongst steam users than his own make has, and he resolves to have an analysis made in order to see where the difference comes in, so as to enable him to effect the desired alteration. More likely than not, if our packing manufacturer is in but a comparatively small way of business, he has not the services of a works chemist at command, and he therefore proceeds to submit the sample to be tested to Professor So-and-So, whose knowledge of the technology of the subject is probably infinitesimal rather than plenary. In due course a report is obtained setting out to the third place of decimals the proportions of such substances present as have not been overlooked. Now, omitting any reference to the sins of omission, however important their bearing may be, it is often found that such reports emphasise quite unimportant matters, and on account of this have a tendency to mislead rather than to guide. Let us suppose, for instance, that a large proportion of that great friend to the rubber manufacturer—we refer to carbonate of lime, or whiting, as it is commonly termed—is present. This body is never chemically pure, but always contains small and varying proportions of oxide of iron, alumina, and carbonate of magnesia. Now, the analyst in his report is almost compelled, on the score of accuracy, to estimate and record these bodies, though our present contention is that it would conduce more to the ultimate advantage of his client if he ignored their separate existence and entered them under the head of whiting. The magnesia in whiting may amount to three or more per cent.; but it would be following a false trail if the manufacturer proceeded to use magnesia to the amount stated in the analysis if he remained in ignorance of the fact that by continuing to employ the whiting he would now have nearly double the proportion present in the sample originally analysed. We hope we make our meaning clear with regard to this statement of results; what is wanted in such cases as these is not so much accurate scientific analysis, but rather figures expressive of the nature and amount of the materials present with regard to the usual state of purity in which they are employed in the particular trade concerned. It may be said that in

going thus far the analyst is going beyond his legitimate functions, and taking upon his own shoulders the burden which his client should carry himself; and certainly if manufacturers generally had a real scientific acquaintance with the composition and properties of all the materials they used there would be no need for the analyst to go beyond the limitation just referred to. But instead of this desirable acquaintance with detail being at all common, the reverse is the case, and the analyst, to be of any real assistance in the case of manufactures, must combine with his scientific knowledge that which has been derived from an intimate acquaintance with the manufacture concerned; that is to say, he must be an expert. In the light of the fact that almost every branch of manufacture now-a-days has some chemist connected with it who has made a name for himself as a referee in cases of dispute, it would seem to be preaching to the converted to insist that manufacturers should in their own interest show discrimination in selecting the analyst who is to assist them. But the recognition of the expert is not general, and it is quite the common thing to find the professor at a college or the county analyst busy with the aid of books investigating a substance of which they have possibly never heard before. Now, if we may say so, this is not as it should be—a remark which could be strengthened did space permit of our enlarging upon the details in cases of fallacious analyses. Few, we imagine, will be found to gainsay the opinion that the whole range of chemical analysis in its relation to manufactured products is much too great a study for any one man, be his attainments of the highest order, to achieve with success; and it would seem that, as is now the rule in many professions, specialisation must become more and more the goal to which the aspirant for analytical honours should direct his efforts. There is already, we are glad to observe, an increasing tendency amongst chemists of repute in some particular line to refuse work connected with matters on which they have no more than text-book knowledge, and to advise that it be sent to some one more familiar with the subject. This seems very right and proper, and where some sort of brotherhood is established among members of the craft, with the object of assisting each other on special subjects, there will be less time lost, and an undoubted gain will accrue to clients. It would be Utopian to imagine that the analyst who is prepared to analyse and report on anything which offers will ever become extinct, but his capacity for evil can be reduced to a minimum in proportion to the perspicacity shown by manufacturers in the selection of their consultants.

The case just referred to was one in which analysts of general attainments only had been engaged, to the exclusion of the expert who, in the exercise of his intimate knowledge, would have certainly reported in such a way that the indictment hurled by the manufacturer at analytical chemistry would never have been uttered. The point seems to be one of more than casual interest, in view of the continual encroachment of foreign imports on trades which have hitherto complacently ignored the possibility of such competition making itself seriously felt. The concentration of mind which the German chemist, no less than his brother in other departments of learning, has shown in various branches of applied chemistry has been taken advantage of to the full by the manufacturers of the Fatherland, to their undoubted advantage. At home we hear on all sides wailings as to our lack of technical education, and the effect which this deficiency is supposed to be producing upon our trades; but is it not possible that the means of salvation are already at hand, and that recourse to them would prove of more immediate value to particular trades than subscribing large sums of money to institutions purveying in many cases education which is anything but really technical?

THE APPOINTMENT OF FACTORY INSPECTORS.

The prospect of the passing of an amended Factory Act has aroused considerable interest in the duties, &c., of factory inspectors. Several inquiries have been made on the subject, and we cannot do better than reprint an answer given in our "Notes and Queries" column in 1898, more especially as the issue is out of print.

The appointments are of two classes:—(1) Male Inspectors of Factories, and (2) Assistants to Inspectors of Factories. The limits of age for the former class are 21 and 30, with an extension up to 38 (*a*) in the case of a person who has been occupied as master, manager, foreman, or workman in a factory or workshop, for at least seven years, and has acquired practical acquaintance with the working of factories and workshop, and (*b*) in the case of a person who may have served as a Factory Inspectors' Assistant with the certificate of the Civil Service Commissioners from a time when he was under 30. The limits of age for Assistants to Inspectors are 21 and 40. The Civil Service Commissioners state that they are authorised by the Secretary of State to make the following announcement:—"Applications for the post of Inspector of Factories or of Assistants to Inspectors of Factories addressed to the Home Secretary will be considered from time to time as occasion may arise or fresh nominations be made. In the event of more than one candidate being nominated for a single vacancy and the examination thus being made competitive, the candidates will be so informed at the time they are nominated." The salary of an Assistant to Inspectors of Factories commences at £100 a year, and rises by annual increments of £5 to £150. The salary of an Inspector of Factories is not stated, but will be found in Whitaker's Almanac for 1898, page 157, and ranges from £200 to £500. The examination fee for assistants is 10s., and for Inspectors, £3. The subjects of examination are as follows:—For Assistants (1) Spelling and handwriting as tested by dictation; (2) arithmetic, first four rules, simple and compound; (3) an elementary knowledge of the principal provisions of the law relating to workshops.

For Inspectors of Factories the subjects are:—(1) Handwriting; (2) spelling; (3) arithmetic, including vulgar and decimal fractions; (4) English composition; (5) theoretical and practical acquaintance with factories and workshops, including a knowledge of their sanitary requirements; (6) applied mechanics, including elementary mechanical drawing; (7) (*a*) the Factory and Workshop Acts administered by H.M. Inspectors of Factories; (*b*) an acquaintance with the history of factory legislation in the United Kingdom.

No person can be appointed Inspector of Factories until the Civil Service Commissioners have issued in his favour a certificate of qualification for the post. Such certificate cannot be issued until the candidate has passed to the satisfaction of the Commissioners in all the subjects specified above. When two or more candidates are nominated to compete for one vacancy the competition will be in the subjects 5, 6, and 7.

If our correspondent desires to obtain a post as Inspector or Assistant he should make written application to the Home Secretary. We must observe that examinations for these appointments do not take place at fixed intervals, but are held from time to time as candidates are nominated by the Home Secretary to fill the vacancies which occur. The application should be written on foolscap paper, and made to the Secretary of State for Home Affairs, Whitehall, S.W. It is often found to be advantageous if a candidate can obtain the aid of a member of Parliament to recommend him to the notice of the Home Secretary.

NEW PUBLIC BATHS FOR BLOOMSBURY.

In his capacity as the first Mayor of the borough of Holborn, the Duke of Bedford last week laid the foundation stone of the new swimming baths which are about to be erected in the district.

The new baths, which will occupy a prominent site in Broad-street, Bloomsbury, are an extension of the public baths and wash-houses erected in Endell-street by the Commissioners for Public Baths and Wash-houses for the parishes of St. Giles-in-the-Fields and St. George, Bloomsbury, in the year 1852. On the coming into force of the Baths and Wash-houses Act, 1846, the Joint Vestry of St. Giles-in-the-Fields and St. George, Bloomsbury, took an early opportunity of adopting the Act, and the existing baths were erected upon freehold land acquired from the Right Honourable the Earl of Harewood, the total cost of land and buildings being about £20,000. The extension which is now in hand has been commenced with the approval of the Local Government Board in consequence of the Commissioners of Public Baths and Wash-houses having arrived at the conclusion that there was a necessity for further accommodation for swimmers.

The design of Messrs. John and S. Flint Clarkson, of Ormond Chambers, Great Ormond-street, having been accepted from several others submitted, a contract with Messrs. F. Gough and Co., of Hendon, for the erection of the baths was entered into. The extension, which will have a frontage in Broad-street of 55ft. and a depth from north to south of 130ft., will provide a swimming bath 90ft. in length, with closed dressing-boxes entered from the platforms. The bath will be paved with mosaic, the walls faced with glazed bricks, and domed ceilings of fibrous plaster will be formed above the lantern lights; a gallery will run round all four sides of the bath-hall. There will also be subways all round. The bath-hall will be entered through a vestibule, &c., from Broad-street.

The height of the bath-hall will be about 40ft. from the bottom of the bath to the domes. The elevation towards Broad-street will be four storeys in height, of Portland stone, red Bracknell bricks being used for the upper floors. The elevation will resemble the existing front in Endell-street, the resemblance being intentionally made so strong that it will be clear that the two frontages are parts of one building. There will also be provided rooms for clubs, and a general supplementing of the existing accommodation. All the floors will be constructed of fire-resisting material. The water in the swimming bath will be heated by steam. Arrangements will also be made for the steam-heating of the atmosphere, so as to counteract condensation, and to enable the bath to be kept in use in chilly weather. The building will be lighted by electricity. It is anticipated that the total cost of the land and baths will amount to the sum of £25,000.

THE INSTITUTE OF SANITARY ENGINEERS

(Incorporated).

OFFICIAL TRANSACTIONS.

The half-yearly general meeting of the members was held on Wednesday evening, June 12th, at the newly-acquired premises, 19, Bloomsbury-square. The report of the Executive and the balance sheet prepared by the auditor, Mr. R. J. Ward, C.A., were considered and adopted. The following gentlemen were elected to represent the Institute as delegates at the forthcoming Congress of the Royal Institute of Public Health, to be held at Eastbourne, July 25th to 30th, viz.:—Messrs. H. M. Apps, C. E. Butcher, E. Durant Cecil, H. M. Dove, J. Farley, A. R. Hutson, J. Jenkins, and E. R. Palmer.

SANITARY INSTITUTE.

DUBLIN EXAMINATION RESULTS.

At an examination in Practical Sanitary Science, held at Dublin on June 7th and 8th, 1901, the following two candidates presented themselves, and were granted certificates:—Thomas Byrne, George Ward.

At an examination for Inspectors of Nuisances, held at Dublin on June 7th and 8th, 1901, nine candidates presented themselves. The following three candidates were certified, as regards their sanitary knowledge, competent to discharge the duties of Inspectors of Nuisances under the Public Health Act, 1875:—John Mark, James Cook, Patrick Hansahan.

National Health Society.

OFFICIAL TRANSACTIONS.

On Tuesday, May 7th, Dr. Newsholme addressed a meeting of the Association of National Health Workers on "The Methods of Preventing the Spread of Disease in Connection with School Life." He first considered the extent to which infectious disease is spread by schools, showing that, although at the present time it is fashionable to attribute all infectious disease to schools, yet that since the passing of the Elementary Education Act of 1870, which provided for compulsory school attendance, and since when there has been a largely increased average attendance, there has been a decrease instead of an increase in the mortality from diphtheria, scarlet fever, and whooping-cough. There has, however, since 1870 been an increase in the occurrence of measles; measles is spread by schools, diphtheria may be, there is possibility of the evolution of ordinary sore throat into diphtheria under circumstances of overcrowding such as obtains generally in elementary schools. It is often difficult to distinguish diphtheria from ordinary sore throat at the beginning, but every child with sore throat should be excluded from school. Whooping-cough is also difficult to diagnose at first—it seems like a bad cold on the chest for the first or second week, after which the characteristic cough appears. However, even during this early period the cough is infectious, and so whooping-cough is easily spread in schools—every child with a cough which makes him sick should be excluded from school. It is a mistake to suppose that scarlet fever is more infectious during the period of desquamation—it is infectious as soon as the sore throat appears.

Attendance at school of apparently healthy children from infected households should be strictly forbidden, otherwise children may be going to school suffering from the disease in an unrecognised condition, or may be convalescent from it, or they may carry infection in their clothes. Teachers naturally urge that there is great loss of school attendance by excluding all the children from a house where there is infectious disease, but there must be greater loss if they are allowed to attend. One partial exception may be made in the case of whooping-cough; this disease chiefly spreads among children under five, therefore Dr. Newsholme thought it sufficient to exclude children from infant schools.

School attendance is much less interfered with when the infectious case is sent to hospital instead of being nursed at home. In the first case the other children of the household need only be kept away from school during the period of incubation—in the latter case they must remain at home during the whole course of the infectious disease in addition to the period of incubation.

Closure of schools is not always justifiable when

infectious disease breaks out in them, for in crowded neighbourhoods children come almost in as close contact in the streets as if they were attending school. Closure is desirable, (*a*) when there are insanitary conditions in the school itself, (*b*) when attendance at schools is greatly reduced by the epidemic, (*c*) in sparsely populated districts where children meet possibly only in school.

ANNUAL REPORTS.

Innerleithen.—The report of Dr. Brock, Medical Officer of the burgh, has just been issued, and is very satisfactory. The sanitary condition of the burgh, it is stated, is in most respects very satisfactory, the public conveniences being kept clean, and refuse being removed before 11 a.m. to a convenient place outside the town. Reeves' patent water filter is now working satisfactorily, and, with an improvement made at the fountain-head, the water is plentiful and good. The Town Council have during the year caused the owners of houses to repair their drains, and the work begun last year is almost completed. There are five bakehouses, the only satisfactory one, as has been frequently pointed out, being that belonging to the Co-operative Society. In one block of buildings, a little way out of the burgh, are three slaughtering-booths fitted up in the most modern way, and these have always been favourably reported upon. Only nine cases of infectious disease were notified during the year, viz., seven scarlet fever, one diphtheria, and one typhoid fever. The birth-rate has been very low, only 17 per 1000. The ratio of deaths under one year of age to the total births during the year was as 66 is to 1000. The deaths from all causes at all ages were 37, thus making the death-rate 14·2 per 1000 persons living.

Kinning Park.—Dr. Hugh Kelly, Medical Officer of Health for Kinning Park, has issued his annual report. He states that the sanitary condition of the burgh was very satisfactory last year. Many improvements were carried out in streets, tenements, and courts. The area of the burgh is 109·10 acres, and the average density of the population is 137·381 per acre. The births registered during the year numbered 560, showing a rate of 40 per 1000. The deaths within the burgh numbered 277, equal to a rate of 19·7 per 1000, as compared with 256 and 18·2 respectively for the preceding year. Adding the deaths which occurred in public institutions, the total mortality was at the rate of 22·71 per 1000 of population. The deaths attributed to zymotic diseases numbered 63. There were two cases of small-pox, the first that had occurred within the burgh for over five years.

Poole.—The annual report of the Medical Officer of Health for Poole (Dr. H. A. Lawton, M.D., D.P.H.) is of a very detailed character. With regard to population the report states:—"Assuming that the rate of increase in the decade 1881-1891 still continues, I estimate the population of the district to be 18,900 to the middle of the year, and 19,186 to the end of the year. The Borough Surveyor, calculating on the number of inhabited houses, estimates the population to be 19,660." As to vital statistics, Dr. Lawton says the number of births registered during the year was 261 males and 265 females, making a total of 526, with a birth-rate of 27·69 per 1000 living. This is an increase of 17 as compared with 1899. The number of deaths registered during the year was 132 males and 160 females, making a total of 292, with a death-rate of 15·37 per 1000. This is a decrease of 33, as compared with 1899. The infantile death-rate was 131·17 per 1000 births, and the zymotic death-rate 0·63 per 1000 living. The birth-rate was a little below the rate for England and Wales in 1900. The death-rate was below the average given for England and Wales during 1900, and this speaks well for the general health of the town.

Rawmarsh.—Dr. Picken, the Medical Officer of Health of the parish of Rawmarsh, has issued his report for the year 1900. The death and birth-rates are stated to be nearly identical with those of 1899, being respectively 17·36 and 40·67 per 1000 per annum. Fifty new houses had been occupied during the twelve months, the total number at the end of December being 2937. Population (estimated) 15,223 against 11,983 at the census in 1891. The mortality of infants under one year is the highest he has had to record—127 against 96; or 8·48 per 1000 inhabitants, and equal to 208 per 1000 births registered. The zymotic death-rate was 3·53 per 1000, against 4·16 for the previous year, and 2·00 for the whole of England and Wales. Reference is made to the water supply, chiefly obtained from Rotherham, and reports of analyses are appended. As to a sample of the Council's water obtained at the Great Central Station House, Rotherham-road, the Analyst states that the results shown are not wholly satisfactory. The presence of nitrates suggests contamination to a limited extent with drainage or similar impurity, possibly the drainage from cultivated land. The polluting matter had undergone tolerably complete destruction by oxidation, so that the water in its present condition was free from other than normal traces of readily-changeable organic matter.

Ramsbottom.—Mr. John Haworth, Sanitary Inspector, in his annual report to the chairman and members of the Ramsbottom District Council of the sanitary work which has been done during the past year, referring to street cleaning, says that during the past year the streets had been regularly swept, the work being done by hand in the early portions of the week, and by machine in the latter portion. The street gullies were also cleaned out weekly, but it was often found that in removing the sludge from the trap, the trap becomes unsealed and acted as a surface ventilator to the sewer, until there was a shower of rain. The practice of adding a disinfectant was of very little use, and should be dispensed with and the water cart sent round. In the main streets the danger was somewhat avoided, as during the summer months these streets were kept well watered, the water being supplied from the Corporation's mains at the fixed hydrants which are situated in the various parts of the district. During the winter time, however, the streets were far from satisfactory, especially after a snow storm, in having to wait whilst a thaw set in to clear it away. It would be much better to have the same removed from public footpaths and the streets where there was much traffic, also the streets with steep gradients, as to those people having to wade through who are not well shod, it is a positive danger to their health. On the question of drainage and sewerage the Inspector says that examinations of the drains have been made in a very large number of cases, and the smoke test applied, which had resulted in the re-laying of several of them, although through the want of proper regulations demanding this work, many were covered up without the Inspector having examined same. Trouble had arisen on several occasions and expense incurred in having to investigate the course and depth of sewers in streets through not having any record of same, and he strongly recommended this drainage and sewerage work to the Council's most careful consideration.

NOTICES.

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The Sanitary Record
AND
Journal of Sanitary and Municipal Engineering.

JUNE 27, 1901.

CLOTHING AND DISEASE.

We are glad to observe that the correspondence which has recently appeared in our columns, commenting upon the risks of infection attached to the manufacture of clothing under insanitary conditions, has found its way into the representative organs of the tailoring Press. It is also notable that, so far from pooh-poohing the idea or characterising it as a "fad," the more important of these journals practically admit the possibilities adduced by our correspondents; one of them, the *Tailor and Cutter*, going so far as to endorse the decision of Mr. M. Finlay, never to buy garments from any maker unless knowing the conditions under which the work is executed. "We wish others," it states, "would follow this gentleman's example, and we should soon find workshops would not only get more healthy clothing, but the rank and file of tailors would get more vigorous as the result of better sanitary conditions under which they work." It is a striking comment on the correspondence in question that last week a case was heard at Worship-street wherein the dangers referred to were exemplified in a startling manner. A person named Cohen, residing in the savoury district of Spitalfields, was summoned for unlawfully removing without disinfection certain clothing which had been exposed to infection, and it transpired in evidence that while the defendant's wife and children were suffering from small-pox, in the same room was a quantity of calico in process of manufacture into ladies' underclothing. The technical offence consisted in the removal of the clothing by defendant, but what became of it—whether it was taken to the retailer to be sold or not—did not transpire. If such was the case it is not difficult to foresee a risk to the community, the seriousness of which it is impossible to minimise. It has been demonstrated by experiment that the germs of disease will live in clothing for an indefinite period, and when it is borne in mind that there are hundreds of outworkers engaged in the occupation of making clothing in districts of the metropolis where insidious disease such as consumption is prevalent, it is not difficult to concede that the spread of infection from these sources may be far more common than is generally supposed. Dr. Anthony Roche, lecturing at Dublin on the evils of sweating, expressed the opinion that sweating opened the door for the spread of consumption in the families of those who bought, used, or wore clothes, manufactured under a sweating system, and this opinion is endorsed by the medical profession generally. There is no gainsaying the fact that the present system of inspection is totally inadequate to protect the public against the risk of infection. And yet the remedy would seem to be simplicity itself. The institution of properly ventilated workshops under efficient supervision, and the complete abolition of sweating dens are, in our opinion, the only measures to meet the case. It matters little whether the workers demand it, the question is one that concerns the health of the public, and as such should receive the attention it deserves at the hands of the Public Health Authorities. We fail to see why the man who sells infected clothes should be less liable to punishment than the man who sells an adulterated article of food; in fact, of the two, we consider the former far more criminally involved. Until factory inspection is made more rigid, and the condition under which outworkers labour is either ameliorated or made impossible, it is hopeless to expect a diminution in the statistics of infection; and it is little short of idiotic to din

the open-air treatment of consumption into the ears of the public, while clothing is allowed to be manufactured in dens in which the germs of the disease are harboured, and from which they are disseminated wholesale, no one knows whither. The question is one we should like to see taken up by influential journals which reach the public eye. But if in the meantime we can only impress its importance upon those officially responsible, we shall, at all events, feel that we have done our part as befits a journal that has worked incessantly for the past twenty-six years in the cause of the public health.

The Concentration Camps.

THE subject of the condition of the concentration camps in South Africa has unfortunately recently entered so heated a political atmosphere that in a strictly non-political journal we feel some delicacy in approaching it, even from a sanitary point of view. And yet it is a question of such grave sanitary importance at the present moment that it is difficult for us to pass it over. It is sincerely to be regretted that the question should have become a theme for party wranglings, for we are convinced that the one desire of the country at large is to deal with the question in the broadest humanitarian spirit. During the past week two reports have been published on the condition of the camps, the one by Miss Emily Hobhouse, and the other through the agency of the *Times*. Making every allowance for the possibility of bias on the part of the witnesses, on the one side or the other, it is unquestionable that these reports are very painful reading, and reveal a state of things which is very serious. The one outstanding feature is the very high rate of mortality. The average for all the twelve camps is stated by the *Times* correspondent to be 116·76 per thousand. In the camp at Bloemfontein it is stated to be as high as 383·16, which is more than double the rate which obtains in the highest of others. The figures, it must be admitted, betoken a very grave situation. We are assured that this high death-rate is due to various special causes, such as an epidemic of measles among the children, that the Boers have been unused to living together in large numbers, and their lack of appreciation of ordinary sanitary precautions which are familiar to Englishmen. We are also told that the death-rate is now rapidly decreasing. Of course, it must at once be recognised that the conditions are altogether exceptional. The administrative Authorities are labouring under the greatest difficulties. There are difficulties of supply and transport, with a limited railway service, difficulties of feeding, clothing, housing, and giving medical attendance to the great crowd of refugees —there are now about 25,000 refugees gathered in the camps—and many others. With regard to medical attendance, we are glad to learn that the Executive have *carte blanche* in this respect, and that in addition to the medical staff already on the spot, eight medical men and eighteen trained nurses are now on the passage from England to relieve the officers of the Royal Army Medical Corps at present doing duty in the camps. The questions of medical care and hospital accommodation are of first importance. Then there is the question of efficient sanitary administration. All these, we trust, the Government will not be backward in dealing with in accordance with the exigencies of the situation. A certain degree of hardship and suffering is, of course, in the circumstances unavoidable, but we trust that all that can be done to mitigate it will be done, so as to uphold the character of the nation for humanity.

A New Model Milk Clause.

A NEW clause relating to milk supply for towns was inserted in the House of Commons last week in a Bill promoted by the Brighton Corporation, and as it is to form a precedent, it is of some public importance. The clause provides that if a Corporation makes an order prohibiting any milk being sent into the city without due cause, or unreasonably refuses to withdraw an order, any dairyman, if not himself in default, shall be entitled to recover from the Corporation full compensation for any damage he may have sustained. Mr. Jeffreys, who moved the insertion of the clause, asked that in the interests of the public health a similar clause should be inserted in all future municipal Bills. Mr. Grant Lawson, on behalf of the Local Government Board, accepted the clause proposed, remarking that the Board thought it desirable that in the interests of public health town and country should work together. He also gave an assurance that the Local Government Board would use their influence towards the insertion of a corresponding clause in other municipal Bills. We are not sure whether it is under this clause or not—the parliamentary report not being very explicit—but we understand that the Government have also decided to insert a model clause in such Bills giving an aggrieved farmer the right of applying to the Board of Agriculture for the appointment of an arbiter. Anything that will reduce the tendency to friction between Urban Authorities and the milk industry will be welcomed.

Prospective Changes in the Vaccination Laws.

THERE are two directions in which attempts are being made to have the Vaccination Laws amended. The one is shadowed in a new Bill introduced by Mr. Channing, which seeks to declare that no prosecution under the Vaccination Acts shall be commenced without the authority of the Guardians. In view of the recent history of the Vaccination Act in some parts of England, the object of this measure is sufficiently apparent. The other proposed amendment of the law is of a totally different character, and owes its inception to Sir Henry Littlejohn, the energetic Medical Officer of Health for Edinburgh. It is to provide for the re-vaccination of all persons every ten years. Sir Henry brings forward this proposal in a special

report prepared by him for his Public Health Committee on the recent small-pox epidemic in Scotland, so far as it affected Edinburgh. This report contains some interesting information. It mentions the fact that when Edinburgh was threatened with an outbreak of small-pox, the Corporation at once took steps to prevent it by urging on all classes of citizens the necessity of re-vaccination; and so successful were their precautions that the town escaped the epidemic. During the whole of last year and up to the present time only ten cases of small-pox had occurred in the city, and of these only seven could be attributed to infection received in this country, the other three cases being traceable to abroad. But this comparative immunity was not achieved without cost. The total number of persons re-vaccinated during the critical period was 29,903, and this at a cost of £3207 0s. 6d. In order to prevent the recurrence of these expensive scares, Sir Henry Littlejohn goes on to say that he believes the time has now come, and that the country is sufficiently educated to approve of the passing of a Re-vaccination Act, and he considers the present juncture specially suitable and appropriate for such a purpose. Acting on this report, the Edinburgh Public Health Committee have agreed to recommend the Magistrates and Town Council to memorialise the Secretary for Scotland, asking the Government to take in hand the necessary legislation.

Amateur Investigators.

Many a good cause is injured by the ill-considered enthusiasm and advocacy of its friends, and often much-needed sanitary reforms are hindered or postponed because of the extravagant statements of self-constituted inspectors and would-be reformers. These people do not go about their work with the idea of finding out the true condition of affairs; but before they commence they have resolved that certain conditions prevail in given districts, and this they set out to prove at all costs. One house is dirty —therefore the whole neighbourhood must be the embodiment of filth. They come across an overcrowded room, and immediately it is proclaimed that this is the condition of all the tenements of the district. They condemn the landlords and tenants alike; the Local Authority is denounced as incompetent, and the Health Officers as doing everything else but their duty. All this kind of thing makes very good copy for the sensation-loving Press, but it gives little help to the cause of reformation. There is a vast difference between a "legal nuisance" and the fancied one of the "amateur" inspector, and if the latter would but take the trouble to make himself acquainted with some of the difficulties surrounding the administration of sanitary law, he would not be so fast in charging officials with neglect of duty. Medical Officers of Health, Surveyors, and Inspectors of all kinds are but human, and when their character is impugned they are bound to defend themselves. If, instead of rushing into print, people who see what they deem to be irregularities would quietly report the same to the proper quarters, the remedy might be quickly and effectively applied. But this they will not do, and their self-imposed zeal is so much energy wasted. The last thing the "man in the street" will do is to help a public official, be he health officer or even a policeman, to defeat wrong doing of any description.

The New Regulations at Bombay.

As might have been expected, the proposed regulations of the new Health Officer at Bombay are not to be allowed to go unchallenged. In the issue of the *Times of India* for June 1st there appears a long article, in which the policy of appointing properly qualified Sanitary Inspectors is seriously questioned. The plea set forth is that the conditions of life and the habits of the people are so different in the East that, given a good Health Officer, under whom shall serve a number of thoroughly efficient and well-trained divisional Health Officers, the work of inspectorship might be carried on by "men of the type of retired military sergeants, police officers, &c." We fancy we have heard this kind of argument at home, and to the sorrow of many places it was acted upon some twenty or thirty years ago. Military training is not always the best preparation for the delicate and important duties to be performed by workers in the public health service. They become so bound up with almost mechanical routine, and so imbued with the idea that everybody must bend an unquestioned obedience to their commands, that they cannot adapt themselves to more pacific and tactful courses of administration. It is too late in the day to argue that "anyone" can be a "Sanitary Inspector." The unskilled man is as big a nuisance in the health service as he is in every other industry. Further, are we for ever to rule India by military methods? Have the educational and social efforts of the past half-century been for nought? and are the natives still incapable of grasping the elementary laws of local administration? We believe there are signs that the teeming millions of our Indian Empire (especially in the great centres) are awakening to the duties of citizenship, and we hope that the Health Officer of Bombay will be supported in his determination to introduce a truly "civil service" into the municipal life of that city.

Extensions at St. Thomas's Hospital.

More than ordinary interest is attached to the latest extensions inaugurated last week at St. Thomas's Hospital, London. It may be, of course, as Lord Lister said, that many of the improvements introduced may be described as luxuries, and not essentials; but it can only be right that our great hospitals and medical schools should be furnished on the highest and best hygienic principles. He did well to remind the students of the possibility of having to perform operations in out-of-the-way places, and under less favourable conditions; but none would desire that the elements of knowledge and power should be gained amidst such crude surroundings. And, fur-

ther, very often the most highly trained and refined natures are those who can best adapt themselves to less favoured circumstances. But it is not so much to Lord Lister's speech that we desire to direct attention, as to the new operating theatres and children's ward. The latter is tiled with Doulton tiles, and there are twenty-two picture panels in "Under-glaze Faience," representing well-known fairy stories. Iron and glass are used for the furniture and utensils of the ward. The operating theatres are designed for the practice of strict aseptic surgery. The walls are composed of Keene's cement covered with white enamel, with a dado of Marmorite—a form of tough opaque glass which offers a very smooth and easily-cleaned surface. Terrazo pavement forms the floor, which is on a slight slope, so that the whole place can be thoroughly flushed with water. The auditorium is in four raised tiers, made solid of white marble, skeleton staging having been rejected on account of the difficulty of keeping it adequately clean and free from dust. The furniture is wholly of glass and iron. The subsidiary rooms, which are finished in the same style as the operating theatres themselves, include anæsthetising rooms, a sterilisation room, where there is a high-pressure steam steriliser for dressings, and a water steriliser for the supply of germ-free saline fluid, a surgeon's room where the surgeon removes his boots and outer clothing and substitutes for them clean boots and sterilised blouses, so that no dirt is taken into the theatres, a recovery room for patients, &c. Ventilation is effected on the plenum system. Air, adequately warmed and forced through filters, is pumped in by rotary fans; the pressure in the rooms is thus always slightly greater than it is outside them, and therefore there is no fear of unfiltered air passing in through crevices or an open door. In short, every precaution has been observed to ensure that perfection of cleanliness which is the essence of aseptic surgery.

In Monday's *Times* Dean Fremantle calls attention to what is perhaps the worst feature revealed by the recent census, viz., the decrease in the birth-rate in the United Kingdom. He points out that in the year 1875 there were born in the United Kingdom 35 children for each 1000 of the people. In the year 1900 they are only 29. That is, for every 1000 of our 41½ millions there are now born six fewer than twenty-five years ago; and this means a loss of 249,000 children for each year. This is a new and strange phenomenon in England; but, what is still more startling, it implies a much more rapid decline of the birth-rate than that of France, where the process has gone on gradually throughout the century. "What," asks the Dean, "is the prospect which this diminution opens to us? If it continues in the next twenty-five years it will have come down from 29 to 23 per 1000; and in less than fifty years from this time it will have been reduced to 17, the lowest figure which we can imagine the death-rate to reach. There will then be no increase of the nation, but as now in France, the prospect of actual diminution. But there is more than this. The process has hitherto affected only special parts of our country. In London the annual birth-rate is about 29 per 1000; in Westmoreland it is about 20. At Gateshead it stands at 33; at Huddersfield at 22. In the latter town, though it is a flourishing manufacturing centre, there are actually 400 fewer people in 1901 than there were in 1891, and the School Board cannot fill their schools." Dr. Fremantle is not alone in his alarm at this phase of our national life. But the question is so many-sided that we are not surprised it is so little discussed. Perhaps the worst feature is the growing disposition on the part of women to avoid the responsibilities of motherhood.

Two excellent appointments were made last week by the City Corporation. First, Dr. Williams, who has acted for the past nine years as Chief Boarding Officer at Gravesend, and had charge of the hospital at Denton for the Port Sanitary Authority of London, was promoted to the position of Medical Officer for the Port of London in succession to Dr. Collingridge. In these positions Dr. Williams has proved himself a most efficient officer, and the City is fortunate in being able to secure one so thoroughly acquainted with the work to be done. The second appointment was that of Dr. F. J. Waldo as City Coroner. This gentleman is well known to our readers. Until the creation of the new London Boroughs, in addition to being Medical Officer for the Inner and Middle Temples, he was Medical Officer of Health for the district of St. George the Martyr, Southwark. In the latter position his conscientious devotion to duty was unpalatable to many of the members of the old Vestry, who would have liked him on more than one occasion to "re-write his reports," because they revealed the existence of unsatisfactory conditions. In his new position we believe that Dr. Waldo's sterling ability will receive a better recognition, and his training as barrister and doctor supply the combination needed to properly carry out the duties of Coroner.

The report just issued by the directors of the Oxygen Hospital covers a period of two years. In 1899-1900 the admissions were not so numerous as previously, the cases already in the hospital being of long standing and taking a proportionately long time to heal. In 1900-1901 the numbers admitted were up to the average, but owing to a falling off of income many deserving cases were necessarily refused. Eighty-one cases were treated during the year, fifty-nine were discharged, and twenty-one remained in the hospital. The income fell to £944 from £1588 in the previous year. The report states that a letter has been received from the Guardians of the Poor of the Parish of Willesden expressing gratification at the excellent results of the treatment of cases that had been sent by them. We are also told that the treatment of lupus had proved entirely successful, cases previously regarded as hopeless having been cured. In view of the treatment of diseases of the lungs it is proposed, when funds permit, to erect cubicles in which the patients can be placed

and supplied with dry, purified, super-oxygenated air. For this purpose at least £200 is needed. The Duke of Argyll presided last week at the annual meeting, and claimed that the hospital could show 90 per cent. of cures, while the cost of maintenance was only 27s. per patient, including 2s. 6d. each for oxygen.

Staines is fast becoming quite a picnic resort for engineers and others connected with waterworks. Last week another party paid a visit to the great reservoirs there, to inspect the progress of the works. The directors of the water companies, their engineers, and contractors, were all congratulated on the advance made, which is considerable since the last visit. Some idea of the size of the reservoirs will be gained when it is known that their circumference is four and a-quarter miles, and that they are one and a-quarter mile long by five-eighths of a mile at their northern end, and nearly a mile wide at their southern end. The embankments vary from 21ft. to 35ft. in height, and are formed of the excavated material with a thick bank of puddled clay in the centre. Inside, the slopes are being thickly lined with concrete to a depth of 15ft., and it is expected that the larger reservoir will be completed during the present year, and the smaller one in the course of next year.

MUNICIPAL ENGINEERING & SURVEYING.

CROSS-TABLE CHAT.

The vacant appointment of Engineer and Surveyor to the Borough Council of Hampstead, caused by the retirement of Mr. Chas. H. Lowe after a long period of service, has been filled by the election of Mr. Oliver E. Winter, Borough Engineer and Surveyor of Poplar, out of eighty candidates. Mr. Winter is well known to his brother engineers as an unobtrusive, genial, and capable engineer, and he has our hearty congratulations on his appointment. The Borough Council of Hampstead will have no reason to regret their judicious choice of Mr. Winter.

I would remind surveyors of districts who are responsible for the supervision of trees in public streets that during the months of July and August the roots of such trees should be watered, or many will be lost through drought. The simplest and most effective method of doing the work is to remove the gravel for a depth of several inches round the base of the tree, forming a hollow or dish into which the water should be run by a hose attached to a street-watering van. The watering should be effected once a week during a continuance of dry weather.

Referring to trees in streets, I would point out that the practice of surrounding such trees with wrought iron tree guards, and iron grids around the base is being generally discarded as both expensive and unnecessary. All that is really requisite is to encircle the tree with galvanised wire netting of 1in. mesh, fastened with ordinary wire, and, when the trees are young, support them with poles known as "ricker poles." Once a year the wires should be examined, released where there is a danger of their cutting into the bark, and again re-fixed. The work can be carried out by any intelligent labourer, but where trees are numerous it is advantageous to employ a man who has served some time as a gardener, who can judiciously trim and lop trees at the necessary and proper seasons, and so preserve their symmetry; for it is suggestive of bad administration that such trees should be allowed to grow as they listeth, as one sees them in some districts, and instead of being ornamental are ugly, and obstruct air and light from houses, and also the light from street lamps.

I am confident that all those Municipal Engineers who have at any time met Major-General Carey, the Chief Engineering Inspector of the Local Government Board, will regret that he has retired from the position. His courtesy and conduct to engineers who had at any time to meet him in the offices at Whitehall were always those of a soldier and a gentleman, and his knowledge of municipal engineering, although himself a Royal Engineer, was sound and reliable, and his advice and assistance could always be depended upon. He has our good wishes in his well-earned retirement.

Major-General Crozier succeeds General Carey in the post of Chief, and Mr. G. W. Willcocks as Deputy Chief Engineering Inspector. Mr. P. Gordon Smith has retired from the post of Architect to the Local Government Board, and Mr. Brook Taylor Kitchin, Deputy Chief, has been appointed to succeed him. As Architect to the Local Government Board, one of his duties is to advise the Board on all building bye-laws submitted for approval, and Mr. Kitchin's intimate knowledge of them is a matter for admiration. He has the advantage of having served under Municipal Authorities, and having acted as Building Surveyor where the execution of the bye-laws as to new buildings was entrusted to him, and he has on more than one occasion related to me his experiences with that well-known individual the jerry-builder, who, however, rarely succeeded in evading his watchful eyes. Mr. Kitchin is thus peculiarly well fitted for the post to which he has been appointed, and his practical knowledge will stand him in good stead.

The shareholders of the Welsbach Incandescent Lighting Company have fallen on evil times. There is again no dividend forthcoming, as appears from the annual report just issued for holders of both the ordinary and preference stock, notwithstanding that there has been an increase of 75 per cent. in the number of burners, and of 46 per cent. in the number of mantles sold, the total sales exceeding that of any other year. The affairs of the company were at one time buoyant and *débonnaire*, but it is doubtful whether they will ever return. The fact appears patent that over-capitalisation is one of the causes of prostration, for the preference stock represents £1,500,000, the ordinary stock £1,350,000, and the deferred shares £629,500, yet none of these receives any dividend. And yet I am bound to say that at no time were the company's burners in more general use for public street lighting than now. Amongst the class of low-pressure incandescent burners the Welsbach burner is pre-eminently the best, and the Welsbach anti-vibrator for street lamps is unequalled, although there are several others on the market which are running them closely.

Whether the present management of the company will make up the ground lost by the bad and unpopular management of their predecessors is difficult to forecast. Their methods in the past caused them to incur the odium of tradesmen and all who had to do business with them to a degree which was most detrimental to the company, and was due in part to the knowledge that their products were a monopoly, and also to an unacquaintance with English business methods. It

would be interesting to know how many thousands of pounds have been spent by the company in litigation.

THERE was another company—the Voëlcker Incandescent Lighting Company—promoted a few years ago, which threatened to enter into competition with the Welsbach Company and sell burners and mantles at about half the price of those of the latter company, but of which little has been heard of late. There are some surveyors and public officials I know who would also like to make its acquaintance. But I doubt whether they are entitled to any sympathy. The *modus operandi* of the promoters was to enlist the active support of the Surveyor to the Local Authority in various towns in the mantle and burner which they produced—but which they were unable to sell, owing, it was said, to their being infringements of the Welsbach Company's patents, but which patents it was stated would shortly expire—and then hold a small public exhibition ostensibly to show the new burners, but mainly as a means of obtaining shareholders. The plan succeeded, and numerous shares were taken, especially by public officials, who fell before the bait offered of about twenty-five shares thrown in gratis for every five paid for. One would have expected surveyors, at least, would have discerned the unsubstantiality of a concern which could throw away shares with such profligacy; but they didn't. SENEX.

Public Works.

SEWERAGE.

THE Oldbury Urban District Council has decided to borrow £18,000 for the reconstruction of sewers in the district.

THE Mytholmroyd District Council has decided to borrow £13,184 from the Public Works Loans Commissioners for sewerage purposes.

THE Bourne (Lancs) Authority has decided to convert its existing sewage works to the Natural Purification Company's system (Cosham's patents,) the contractor having received orders to commence at once.

THE Heavitree District Council has decided to apply to the Local Government Board for leave to borrow the sum of £3500 for the purpose of providing an outfall sewer for the Polsloe Priory Estate, also that application be made for leave to borrow £2500 to pay off the existing mortage of that amount on the sewage farm, Worford.

A LOCAL Government Board inquiry was held last Friday at King's Heath Institute by Colonel W. R. Slack, R.E., respecting an application made by the Urban District Council of King's Norton and Northfield for sanction to borrow £3558 for works of sewerage. It was proposed to effect a re-construction of defective sewers at King's Heath, Moseley, Selly Park, and the Cotteridge at a cost of £615 10s., the introduction of an improved sewer ventilation throughout the whole of the Council's sewerage system within the Tame and Rea drainage area at a cost of £1812, and the carrying out of a scheme of improved sewer flushing at a cost of £1130. The system of ventilating the sewers by means of open gratings in the surface of the streets was found to be imperfect, and periodically led to complaints from residents in various parts of the district. Dr. Hollinshead said there had been a great deal of illness in the district; whether it was due to the open gratings he could not say. There was no opposition to the application, which it was pointed out was of great importance to the health of the district.

COLONEL A. G. DURNFORD, R.E., conducted an inquiry at Radcliffe-on-Trent last week with respect to the application of the Rural District Council of Bingham for sanction to borrow £8050 for the purpose of sewerage and sewage disposal for the parish of Radcliffe.

AT a recent meeting of the Leeds Sewerage Committee, it was intimated that the chairman of the Committee (Alderman Harding) intended calling a special meeting at an early date to consider the whole question of the disposal of Leeds sewage. Under these circumstances it was decided to visit the Knostrop works on the same day as the special meeting.

FURTHER evidence was given last week before the Select Committee of the House of Commons presided over by Mr. Bill against the proposals of the Derby Corporation for extension of the borough boundaries, the execution of sewage works, &c. The Chairman, in the course of the evidence, said that the Committee was impressed with the feeling of the neighbourhood against the establishment of the works. Mr. Baldwin Latham, C.E., the well-known authority on sewage questions, condemned the scheme proposed by the Corporation. The whole of the district proposed could not be drained by gravitation into the sewers, the site was ill-chosen, and the character of the soil not suitable for sewage works. Mr. Hugo Young, K.C., after speaking against the proposal to extend the tramways in the direction of Darley Abbey, called witnesses on behalf of the Shardlow union, Mr. Edwin Conner, J.P., chairman of the Rural District Council, stating that the district was unanimous against inclusion of the proposed areas, and that their affairs were already well managed. Dr. Hogg, the Medical Officer for the district, also gave evidence in opposition to Derby's proposals, stating that there was no reason, from a sanitary point of view, why the outside districts should be annexed to Derby. Mr. Freeman, K.C., having addressed the Committee in support of the Shardlow Rural District Council, the Committee again adjourned.

AT a recent meeting of the Alnwich Urban District Council a report upon the sewage dispossl of Canongate, where a system of sewerage purification is in operation, was received from Dr. Hembrough, Medical Officer of the County Council, who had made an inspection recently. The report briefly was to the effect that the sewerage of Canongate is, and had been for a long time, in a most unsatisfactory condition. The rest of the sewerage of the town of Alnwick was drained to the new sewage disposal works, including 4·5 acres of land for broad irrigation, opened in 1897. The prospect was then held that the necessary alterations in the sewerage of Canongate would be undertaken, but nothing appeared to have been done beyond the removal of obstructions that had from time to time arisen; the substitution of a few socketed pipes for some of the butt-jointed pipes laid down forty years ago or more. In the course of the low-level intercepting sewer were placed two catchpits, and the proportion of sewer extending from the first catchpit above the Lion Bridge to 250 yards above Denwick Bridge appeared to be in a bad condition, and the appearance at each outfall above and below the Lion Bridge could only be described as disgusting in the extreme. In spite of daily attention and considerable yearly expense, the sewerage system for the Canongate portion of the town was a distinct failure as regarded purification of sewage, and a most prominent instance of river pollution was here to be found, by the river having no rapidity of flow and eight weirs being constructed between a short distance above the Dairy and the new outfall from the irrigation ground at Hesleyside. The existence of these weirs in so short a stretch of river emphasised the necessity of all impurities being excluded by every possible means. It was agreed to refer Dr. Hembrough's report to the Sewage Disposal Committee for consideration, and report thereon.

A LETTER has been received by the Tutbury Rural District Council from the Local Government Board with reference to the proposed sewerage and sewage disposal scheme of Barton-under-Needwood, and inquiring into the present position of the matter. It was resolved to approach Sir Reg. Hardy as to what terms he would sell on lease the land to the Council. The Clerk was instructed to inform the Local Government Board as to what was being done.

IN accordance with the requirements of the Public Health Act of 1875, the members of the Builth Wells Urban District Council have applied to the Local Government Board for permission to borrow £1288. This money is to be devoted to street improvements, including the main roads, the culverting of Gloewbrook, and sewerage improvements. The Local Government Board has directed an inquiry into the subject matter of the application, and Inspector E. A. Sandford Fawcett, A.M.I.C.E., will attend at the Magistrates' room, Builth Wells, in the forenoon of Friday, the 28th inst. The object of the public inquiry is to receive the evidence of any persons interested in the matter of the aforesaid improvements or expenditure.

LAST week a meeting of the Armagh Urban Council was held, when the engineer in charge of the sewerage scheme, Mr. J. Finlay Peddie, C.E., Belfast, and the consulting engineer, Mr. J. Kaye Parry, C.E., Dublin, were present. A long discussion took place regarding the connecting of existing sewers and drains with the works at present being carried out in the city. Mr. Kaye Parry was asked for his opinion regarding these connections, and also regarding the carrying away of surface water. He contended that a considerable responsibility in the matter lay on the owners of houses to see that their sewers were connected with the new scheme, but he said in the case of a sewer connecting several houses he thought the Council would be liable to see to the connection. He approved of Mr. Peddie's idea in not duplicating the system in order to carry away surface water, as, in his opinion, that would have been a very expensive undertaking, and he suggested that in all cases where surface water had to be taken away special arrangements should be made, so as to prevent the surface water getting into the pipes laid for the sewage matter alone. A long discussion took place regarding the disposal works to be adopted by the Council. Mr. Parry made a statement, and produced plans of disposal works by Adams's installation. He showed that, under the original scheme, the septic tank was a closed one, and he drew a comparison between the open and closed tanks, showing that no provision was made for the cleaning out of sludge in the closed tank, and that in the plan of an open tank submitted by him arrangements were made for the removal of sludge. Coming to figures, Mr. Parry showed that roughly the cost of the original scheme, including the royalty of £1000, was £4085, and that under his scheme, which included Adams's installation at a cost of £450, the total outlay would be about £4500, but they would have almost three times the capacity. After hearing Mr. Parry's statement the following resolution was unanimously adopted :—" That having heard the lucid statement of Mr. Kaye Parry, C.E., our consulting engineer, upon a disposal works scheme, sketched plans of which he has submitted to us, and as he has agreed to give the substance of his statement and the financial portion of it in writing, we hereby approve of the scheme which he has submitted, and adopt it for the Armagh disposal scheme, and request Mr. Parry, C.E., to prepare the plans and specifications necessary, and also to prepare plans for the Local Government Board with as little delay as possible, and should the cost of said work exceed the balance, £2000, that we approve of an application being made for a sum over and above same not to exceed £2000."

WATER.

IT is estimated that the Leeds waterworks will yield a clear profit of £10,000 for the year.

THE Whitehaven Rural District Council requires a loan of £450 to enable it to lay down water mains at Sandwith.

MESSRS. JAMES SCOTT AND SON, Aberdeen, have received the contract for the erection of a new water reservoir at Strichen. The contract price is £139 12s.

THE Dronfield Urban District Council has agreed to apply to the Public Works Loan Board for a loan of £2500 at 3¼ per cent., repayable in three years, for the purpose of providing a water supply.

THE Law and Finance Committee of Greenock Water Trust has approved a recommendation to purchase, for the sum of £1110, the millstead of Messrs. Mackenzie and Walker, Shawswater Grain Mills, Dellingburn-square.

A SPECIAL meeting of Scarborough Rural District Council was held last week for the purpose of executing the deeds of mortgage relative to the East and West Ayton water supply. The amount of the loan was £2600, apportioned between the townships, East Ayton being chargeable with £1100 and West Ayton £1500.

THE Epping Urban Council has unanimously decided to appeal to the Local Government Board for advice in the water supply difficulty. For some time complaints have been rife as to the insufficiency of water. The Council complains that the Herts and Essex Water Company continue to extend the mains without providing an adequate supply of water.

A PUBLIC inquiry has been held at the Maldon Workhouse by Col. W. Langton Coke, M.I.C.E., one of the Local Government Board Inspectors, with reference to an application by the Maldon Rural Council for sanction to borrow £2800 for purposes of water supply for Althorne, Cold Norton, Hazeleigh, Latchingdon, North Fambridge, Purleigh, Stow Maries, and Woodham Mortimer.

THE Thurso Town Council, after years of discussion, and many attempts to stave off the pressure put upon it by the Local Government Board, at a special meeting last week, took the first steps to solve the question of augmenting the water supply of the town, and providing an adequate drainage scheme. By a large majority, it was agreed to employ Mr. David Reid, C.E., Inverness, to visit the town and report as to the best method and the probable cost.

NOTWITHSTANDING the large and increasing demand on the part of the public at this time of the year for street and garden watering and for sewer flushing, it is satisfactory that the level of water in the Winchester Water Company's deep wells has maintained a daily average of 20ft., and this notwithstanding that the daily supply fram the water mains amounts to forty gallons per head of the population of the city. Recent analyses prove that the water of the Winchester Company retains its noted purity and excellence.

AT the last meeting of the Helston Rural District Council, the Local Government Board wrote asking to be informed of the position of the water supplies for Kennegie, Germoe, and St. Keverne, and the insanitary condition of the latter place. It was decided to reply that the first-named matter was receiving attention. With regard to the St. Keverne water supply, the Inspector, Mr. Joyce, was asked to meet the Water Supply Committee of the Parish Council and report the result of the consultation to the Council. The analyst's report on the water at Porthallow being unfavourable, the Council, on the recommendation of the St. Keverne Committee, decided to fork the water out of the well, and have another sample taken in a month's time.

Of the 460 samples of impounded and filtered water supplied to London examined bacteriologically during May, 70 samples, or 15·2 per cent., were sterile.

The Waterworks Orders Confirmation (No. 1) Bill came last week before the Select Committee of the House of Lords, over which Lord Harris presides. The object of the Bill is to confirm certain Provisional Orders made by the Board of Trade, one of which enabled the South Staffordshire Waterworks Company to raise new capital. This latter Order was opposed by the Kingswinford Rural District Council.

With reference to the recent complaints from Newport as to an inadequate water supply, the Water Engineer reports to the Water Committee of Dundee Town Council that the work of scraping the Newport main from Wormit reservoir to Cupar-road has been finished, that the operation has been very successful, and that there is now an adequate supply at the higher terraces. He also reports that the cost of the work has only been £108, against an estimated cost of £135, and that the scraper might be passed through the main at any future time at a cost of about £5, or even less.

The Prestatyn Water Bill, which seeks to authorise the Urban District Council of Prestatyn to purchase the undertaking of the Dyserth, Meliden, and Prestatyn Water Company, and to construct additional waterworks for an increased supply, came last week before a committee of the House of Commons, over which Sir John Brunner presided. The Bill has already passed the House of Lords. Lord Windsor, the Ecclesiastical Commissioners, and Mrs. Conwy, owners of property affected by the Bill, opposed in that House, and clauses were inserted which satisfied Lord Windsor and the Commissioners, but not Mrs. Conwy, who again petitioned against the Bill.

Last week, at Webbington, Mr. G. B. Sully, chairman of the Burnham Urban Council, officially turned the water into the new mains, which have just been laid between Webbington and the pumping station, Brent Knoll. Mr. W. J. Press, of Burnham, is the engineer, and the present scheme is to prevent the waste for the future of 70,000 gallons of water daily, by providing an additional 8in. main. Eventually Mr. Press's scheme provides for bringing the whole of the supply of water at Winscombe to Burnham, by placing a new 12in. main to Webbington, when both the original 6in. main and the new 8in. main will be fully utilised. After the ceremony, Mr. Sully entertained the company to luncheon at Brent Knoll. Mr. W. H. Smith, of Clifton, is the contractor for the present scheme, which has cost £4500. The mains are arranged to cross the river Axe upon steel girders.

The Waterworks Committee of the Leeds Corporation met last week, when it was decided to lay a 10in. main from Victoria-road, Headingley, to Woodhouse Moor Police-station, and generally increase the water supply in the neighbourhood. This main will serve the Yorkshire College. It was further decided to lay a 24in. main from East End Park to South Accommodation-road, the tenders of the Staveley Coal and Iron Company for casting the pipes, and of Messrs. Young, of Cullingworth, for carting and laying the pipes, being accepted. The City Engineer (Mr. Thomas Hewson) reported that the 30in. main from Eccup to Swinsty had been laid for a distance of 8104 yards, the total length being 20,530 yards. An agreement had been entered into with the Great Northern Railway, enabling the Corporation to complete an 18in. main from Woodhouse to Wortley reservoir. It was also announced that the reservoirs in the Washburn Valley contain 94 days' supply of water—with a daily requirement of 27,000,000—as compared with 73 days' supply—with a daily requirement of 26,250,000 gallons—at the corresponding period of last year.

LIGHTING.

The Otley Gas Bill has been read a third time in the House of Commons.

The South Metropolitan Gas Bill has been read a second time in the House of Lords.

The Chester Gas Bill, for confirming further powers upon the Chester United Gas Company, has passed the Chairman of Ways and Means as an unopposed measure. It will be sent for third reading in the Commons. It has passed through the House of Lords.

The South Metropolitan Gas Company gives notice that, concurrently with the reduction of the standard illuminating power of gas from sixteen to fourteen candles, from the 1st prox., the price charged for gas to consumers will be reduced 5d. per 1000ft., namely, 2s. 8d. to 2s. 3d. per 1000 cubic feet.

The Local Government Board holds an inquiry to-day at Bath into the application of the Bath Surveying Committee for sanction to borrow £1200 for wood paving and street improvements. The Committee intend to apportion £550 for repairs to the bridge at Abbey View, and £650 for wood paving. An inquiry is also to be held at the same time into the application of the Electric Lighting Committee to borrow £4000 for the purposes of electric lighting.

For some time the question of giving the Thornton Heath Baths the benefit of the electric light has been under consideration. It has at last been decided to introduce it to the swimming bath, and public hall, and the drying and store rooms. This will not only be a great improvement as regards convenience, but will very materially conduce to public safety. Tenders have been invited for the work, and if it can be given into local hands so much the better.

The Poulton Gas Bill, which has already passed through the House of Lords, came, on Thursday, as an unopposed measure before Mr. W. J. Lowther, Chairman of Committees, in the House of Commons. The object of the Bill is to provide for the transfer of the undertaking of the Poulton-le-Fylde Gas, Coal, Lime, and Coke Company to the District Council, and to authorise that Council to supply gas, and for other purposes. Various verbal amendments having been made, it was allowed to pass the committee stage, and in due course will be reported for third reading.

A Bill to confirm certain Provisional Orders made by the Board of Trade, under the Electric Lighting Acts, 1882 and 1888, came last week before the Examiners of the House of Lords for proof of compliance with the further Standing Orders, the measure having been already passed by the House of Commons. Amongst others was one enabling the District Council of Trowbridge to supply electricity within their area. There was no opposition at this stage, and the necessary formal proofs having been given, the Bill was ordered to be reported for second reading. Mr. Stevenson, the engineer or adviser, appointed by the Council, has been in Trowbridge conferring with the Electric Light Committee.

The electric light was formally inaugurated at Keighley by the Mayoress on Saturday, the 15th inst. Two powerful engines and dynamos were started by the Deputy-Mayoress and Mayoress, whilst Mrs. W. Clough set the electric motors in motion from the switchboard. Alderman B. S. Brigg, in tendering thanks to the Mayoress, remarked that he believed it was nearly three-quarters of a century ago since—not perhaps on that identical spot, but within a very few yards of it—their forefathers wisely established the gasworks. The Mayor also said a few words, and took the opportunity of acknowledging the services of Mrs. Brigg and Mrs. Clough. The party subsequently made a tour of inspection through the works, under the guidance of Mr. J. M. Smyth, the Electrical Engineer.

The Stafford Corporation finds it necessary to spend £7000 in gasworks extensions.

Mr. M. K. North, A.M.I.C.E., one of the Local Government Board Inspectors, held an inquiry at Beckenham recently into the application of the Council to borrow £20,000 for the extension of the electric light at Beckenham, £780 for purposes of street improvement, and £275 for the public baths.

The Stroud Gas Bill, which has already gone through the Commons, has passed the House of Lords Committee on unopposed measures, and has been sent for third reading in the Upper Chamber. The Bill authorises the conversion of the existing capital, and empowers the company to apply for a Provisional Order to supply electrical energy.

GENERAL.

The Bradford Town Council has decided to establish a bacteriological laboratory.

The Salford Corporation has voted a sum of £1200 for the erection of bandstands in four public parks.

The Duke of Bedford, as Mayor of Holborn, laid the foundation-stone on Wednesday in last week of a new swimming-bath in Endell-street, to be erected at a total cost, including that of the site, of £25,000.

Col. A. C. Smith held an inquiry at Farnworth last week into the local District Council's application for sanction to borrow £14,000 for the erection of a Town Hall and public offices in the centre of the town.

At Dudley Town Hall last week Colonel W. R. Slacke, R.E., held an inquiry relative to the proposal of the Town Council to borrow £500 for the provision of public conveniences in connection with the open markets.

Mr. H. Timbrell Bulstrode, M.D., Local Government Board Inspector, held an inquiry at Stanmore recently into the application of the Hendon Rural District Council for sanction to borrow £7500 for the erection of an isolation hospital.

The Chiswick Urban District Council has instructed the surveyor to prepare plans, specifications, and estimates for the erection of an isolation hospital. The surveyor has also been directed to ascertain as to what was the best arrangement for a temporary bath to be erected at some point on the banks of the Thames.

A Board of Trade inquiry has been held at the Warrington Town Hall by Colonel Von Donop into the application of the Warrington Corporation for powers to borrow £66,000 for the purpose of laying tram lines from Sankey Bridges to Latchford Swing Bridge and a branch line from Warrington Bridge to the Swing Bridge, Stockton Heath.

At a meeting of the Birmingham Board of Guardians on Thursday a resolution was passed to appoint a Special Committee of the Board to take into consideration the desirability of erecting a sanatorium for advanced cases of phthisis. It was stated that last year nearly 800 people had died in the city from phthisis, and that in the last ten years no fewer than 8000 had succumbed to it.

Lord Lister, in the presence of a number of gentlemen of the medical profession, last Thursday declared the new wing of St. Thomas' Hospital open for the reception of patients. The new building, which has been erected at the cost of about £20,000, provides the hospital with a children's ward containing sixteen beds, and with two operating theatres, which are probably the most perfect rooms for the practice of aseptic surgery to be found in Europe. In each theatre everything calculated to harbour dust is avoided, and every improvement that ingenuity can suggest as making for cleanliness has been adopted.

A Local Government Board inquiry has been held at Cardiff in respect to an application made by the Llandaff and Dinas Powis District Council for permission to borrow £8500 for the construction of an isolation hospital at Pantawel Radyr.

A Local Government Board inquiry has been held at Swindon, Wilts, to inquire into the application of the Council to be allowed to borrow the sum of £3295 for the purpose of increased water supply, and the sum of £839 for street improvements.

At a recent meeting of the Tottenham Urban District Council the General Purposes Committee recommended the Council to carry out the improvement on the north side of St. Ann's-road, at an estimated cost of £2320, and on the south side at a cost of £760. It was decided to have a special meeting of the Council to consider the tenders in regard to a refuse destructor.

With the object of getting rid of insanitary areas, the Fulham Borough Council has requested the London County Council to include in its next General Powers Bill a provision that all property owners shall, upon request, be compelled to declare their ownership to the Sanitary Authorities and to their tenants. The opinion of the Fulham Council is that much of the slum property is owned by persons in such a position that if they knew that their names could be ascertained and published, they would cause such property to be kept in a more sanitary condition.

Mr. Powderly, superintendent of immigration in the United States, has ruled that tuberculosis is a dangerous contagious disease; and it follows under the general law that consumptives are not to be allowed to land. This drastic ruling, it is said, will be held to apply to ordinary travellers, as well as immigrants, to saloon passengers as well as those arriving in the steerage. Difficulties of detection will probably make the regulation a dead letter for well-to-do travellers; otherwise the heating climates of Colorado and Southern California would actually be debarred them.

The interest shown in the sittings of the Parliamentary Committee on the new Factories Bill, and in legislation dealing with industrial questions generally, has produced many inquiries for works relating to factories and workshops. To meet the demand for authoritative literature on this subject, Messrs. Eyre and Spottiswoode, Government publishers, East Harding-street, E.C., announce the publication of a new edition of Abraham and Davies' "Law Relating to Factories and Workshops," corrected throughout, with all the latest rules and orders, and a revised list of cases.

The New Mills Urban District Council's seal has been attached to an agreement with the County Council for the repair of the main roads for £1500. A committee has been chosen to consider the question of a recreation ground for the district. It was reported that the Stockport Corporation had agreed to supply the Council with water in New Mills for an annual payment equal to 4 per cent. on the proportion of capital expended in bringing the water to New Mills. If a lower rate is conceded to the Hayfield District Council the New Mills rate is to be lowered accordingly.

In accordance with a resolution passed by the Salisbury Town Council, tenders have been invited for the supply of a refuse destructor, which will be used in connection with the new sewage works. The following were the estimatss, viz.:—Mr. Hale, £1500; Messrs. Wort and Way, £1488; Mr. Dawkins, £1430; Mr. Hawkins, £1390; Messrs. Kite and Son (accepted), £1355. The tenders for the chimney shaft, 120ft. high and 5ft. internal diameter, are as under, viz.:—Mr. R. Neal, £869; Messrs. Wort and Way, £798; Mr. Hawkins, £685; Messrs. Wilson Bros., Lamplough (accepted), £625.

On Monday the Dowager Lady Tweedmouth opened the dwellings for working classes recently erected by the Bath Corporation at a cost of over £10,000, the project being the first of two important schemes which the Corporation has undertaken. At a luncheon given subsequently by the Mayor, Mr. Silcock, Lord Tweedmouth congratulated the city on its progressive policy, and dwelt on the importance to all sections of the community of the proper housing of the working classes. He thought wider powers should be given to local authorities in dealing with this question.

At the meeting of the Spalding Rural District Council on Monday last a motion was made for the adoption of the Housing of the Working Classes Act in Donington. It was urged that to stop the depopulation of the rural districts revealed by the census better housing accommodation was necessary. Cases were cited of a family of seven living in a house with but one bed-room, and of a man, wife, and seven and eight children in houses with but two bed-rooms, one "not fit for a dog to sleep in." It was believed that the necessary houses could be built with little or no charge on the rates. The Council decided to take steps to use the powers given by the Act.

At the last meeting of the Stepney Borough Council, the Works Committee reported that the Borough Engineer had submitted to them a report on the question of scavenging throughout the borough. This report they had approved, and were of opinion that the principles embodied should be adopted by the Council. They were further of opinion that the difficulty of providing suitable tips for the disposal of rubbish—a difficulty which they apprehended would increase in the future—as well as having regard to the fact that scavenging could be better carried out by the Council than by a contractor who, owing to the varying conditions of the weather, is unable to estimate to undertake the work efficiently, and at the same time guard himself from loss, that the Council should adopt the following recommendations:—(*a*) That the Council adopt the principles of the report and carry out the suggestions contained therein.—(*b*) That the committee is of opinion that the Borough Engineer should get out an estimate of the area required for the purpose of the disposal of refuse in the borough, such area to contain sufficient room for destructor, slop tanks, and electric lighting station, with reasonable provision for extension. (*c*) That this committee is of opinion that the disposal of refuse in the future should be as far as possible by means of destructors, and further that an additional destructor should be immediately provided in the borough. As bearing upon the question of scavenging they submitted the following recommendation:—That the Council do undertake the dusting, sweeping, and watering of the whole of the streets in the borough at the expiration of the existing contracts in St. George's and Limehouse.

PERSONAL.

Dr. Grindrod has been reappointed Medical Officer for Norden.

Dr. W. H. Andrews has been appointed Medical Officer of Health for Modbury.

Dr. Campbell has been appointed Medical Superintendent of the Caterham Asylum.

Mr. E. D. Long has been appointed Electrical Engineer for the urban district of Grays.

Mr. J. W. Sunderland has been again chosen as Nuisance Inspector for Norden.

Dr. J. Taylor has been reappointed Medical Officer of Health for Chester-le-Street rural district.

Mr. W. A. Millward has been reappointed Inspector of Nuisances for Llandrindod Wells.

Dr. J. C. Saunders has been appointed Medical Officer of the Bootle division of the West Derby union.

Dr. Heather has been appointed Medical Officer of Health for Bredwardine, in room of Dr. Featherstone resigned.

The death occurred on Sunday morning, the 16th inst., of Mr. W. O. Hulm, Town Clerk of the borough of Pembroke.

Mr. W. H. Martin, of Newcastle, has been appointed Inspector of Nuisances for Whitley at a salary of £90 per annum.

Dr. Don has been appointed Public Vaccinator for Newcastle-on-Tyne, and Dr. Simpson has been appointed Medical Officer.

Mr. A. Green has been re-elected Medical Officer of Health for Ringwood, and Mr. H. D. Holloway, Inspector of Nuisances.

Dr. Harcourt Gervis has been appointed Medical Officer to the West Hampstead Branch of the Hampstead Provident Dispensary.

Dr. Chas. Harrison has been reappointed Medical Officer of Health, and Mr. T. Brown Sanitary Inspector for Bracebridge for the ensuing twelve months.

Dr. Anderton has been re-elected Medical Officer, and Mr. Chadwick Surveyor and Inspector of Nuisances for the urban district of Ormskirk, at salaries of £50 and £80 per annum respectively.

Dr. Herbert Williams, the senior boarding Port Medical Officer at Gravesend, and Medical Officer of the hospital, has been appointed Medical Officer of the Port of London, at a salary of £650 a year.

Mr. James Dodd, Assistant Sanitary Inspector to the Borough of Crewe, has received the appointment of Additional Sanitary Inspector to the County Borough of Reading, at a commencing salary of £100 per annum.

Mr. S. G. Moore, of Liverpool, has been appointed Medical Officer of Health for Huddersfield, at a salary of £400 per annum, in succession to Dr. Annis, who will shortly commence his duties as Medical Officer of Health for Greenwich.

Mr. William Ethelbert Boughey, Clerk to the Medical Officer of Health for the Borough of Crewe, has received the appointment of Clerk in the Borough Treasurer's Department of the West Ham Borough, at a commencing salary of £100 per annum.

Mr. David J. Reid, C.E., Inverness, has been asked by the Thurso Town Council to report as to the best methods to be adopted, and as to the probable cost, of providing an augmented water supply and an adequate drainage scheme for the burgh, which is gradually growing in importance.

FORTHCOMING MEETINGS.

JUNE.

Friday 28th and Saturday 29th.—The Sanitary Institute—Examination in Practical Sanitary Science, Practical Hygiene for Teachers, and for Inspectors of Nuisances, Bradford.

Saturday 29th. — Architectural Association — Visit to Colney Chapel Convent, St. Albans.

JULY.

Thursday 4th.—Annual Meeting and Conference of the Urban District Councils Association at the Westminster Palace Hotel.

Saturday 6th.—Opening of the New baths at Wandsworth.

OBITUARY.

MR. JAMES JEMSON.

We regret to announce the death, under exceedingly painful circumstances, of Mr. James Jemson, Surveyor and Inspector of Nuisances to the Preesall Urban District Council. The deceased gentleman, who was 51 years of age, was a native of the Fylde, and went to reside in Fleetwood about five years ago. Previous to that he lived in the Over Wyre district. On the creation of the Preesall Urban District Council, Mr. Jemson was appointed Surveyor and Inspector of Nuisances under the Council, and he was only reappointed to the office a few weeks ago. For some time he has suffered from sleeplessness, a most distressful complaint, and had been in the habit of taking sleeping draughts. On the evening of the 16th inst. he went to Mr. Gornall's, chemist, Fleetwood, and obtained a draught similar to what he had been accustomed to taking, and then went home to bed. About two o'clock on Sunday morning he got up and went to Dr. Robinson for another draught, and the doctor gave him a bottle containing four doses. Mr. Jemson then returned home, and apparently took all the medicine at once and went to bed. Directly afterwards he commenced to cough and sneeze violently, and although a doctor was sent for and arrived within a few minutes, he died before the doctor's arrival. Deceased leaves a widow and three children, with whom the deepest sympathy is felt.

LAW CASES.

The Pollution of Rivers.

IMPORTANT APPEAL CASE.

An important point under the Rivers Pollution Prevention Act came up on the 22nd inst., in the King's Bench Division, before Mr. Justice Ridley and Mr. Justice Bigham, sitting as a Divisional Court. The case was that of the West Riding of Yorkshire Rivers Board *v.* the Scarr End Mill Company, and the appeal was from Judge Cadman, of the Dewsbury County-court. Mr. C. F. Lowenthal was for the appellants, and Mr. C. A. Russell, K.C., and Mr. Ellison for the respondents.

Mr. Lowenthal, in opening the case, said the appeal raised a short but important point in the construction of the Rivers Pollution Prevention Act, 1870. Under Section 4, it was made an offence for a manufacturer to cause polluting liquids to flow into a river, and under Section 10 a County-court judge might by a summary order restrain such action, disobedience being visited with a penalty of £50 per day. This was a highly penal statute, and, having regard to that fact, provisions had been inserted in the Act in the interests of an alleged offender. One of these provisions set out that no such proceedings should be taken without the consent of the Local Government Board, and it was also provided that in giving or refusing consent, the Local Government Board should have regard to the industrial interests involved, and to the circumstances and requirements of the locality. Therefore the Local Government Board were not to give their consent if they thought the pollution could not be stopped without unduly interfering with the industrial interests affected.

Mr. Justice Bigham: What is the point?

Mr. Lowenthal said the point was this. Under Section 13 of the Act no proceedings could be taken unless two months' notice of the intention to take proceedings had been given, and the appellants contended that it must be such a notice that, when it was given, the Rivers Board must be in a position to take proceedings. If when they gave the notice, and it expired, they were not in a position to take proceedings, not having obtained the consent of the Local Government Board, then the notice was bad, because the whole object of the notice was defeated.

Mr. Justice Bigham: What is the object of the notice?

Mr. Lowenthal: To enable the alleged offender to take steps to abate the nuisance, and prevent the necessity of proceedings.

Mr. Justice Bigham: Why did this notice not enable him to do so?

Mr. Lowenthal: Because when he got it he knew no consent had been obtained from the Local Government Board.

Mr. Justice Bigham: How does that matter? Why did that prevent him taking steps to abate the nuisance?

Mr. Lowenthal: It did not prevent him; but the question is whether your Lordships think that burden should be imposed on him, when it might be that when the Local Government Board are applied to for their consent they may refuse it.

Mr. Justice Bigham: The object of the notice is to enable the alleged offender to act upon it.

Mr. Lowenthal: But ought such a person to be compelled to act on a notice which may turn out ineffective?

Mr. Justice Bigham: If that is a question I am prepared to answer it at once—Yes. (Laughter.)

Mr. Lowenthal said that would defeat the provision which was inserted in the Act for the benefit of the alleged offender.

Mr. Justice Ridley did not think so. The offender was entitled to two months' notice, and was also entitled for it to be shown that the Local Government Board had given consent to the proceedings. If they had not given their consent up to the time of the notice, then perhaps the offender would get six months' notice.

Mr. Lowenthal said in that case there would be no effective notice at all.

Mr. Justice Ridley: The Act says nothing about effective.

Mr. Lowenthal urged that the respondents could have no intention of taking proceedings till they knew if they were in a position to do so, and if the Local Government Board refused consent they would not be in that position at all.

Mr. Justice Ridley: No, but it is a notice that they intend to take proceedings.

Mr. Lowenthal said that construction would mean that when a man got a notice he must act on it, though the expense he went to might be thrown away.

Mr. Justice Bigham: He need not act upon it. He may think he is quite safe, and that the Local Government Board won't give consent, or he may think the matter is so doubtful that he had better alter his methods of business.

Mr. Lowenthal said the Act also provided that any person against whom proceedings were intended to be taken should have an opportunity afforded him of appearing before the Local Government Board and being heard against such proceedings being taken. That carried the argument further. If notice could be given before the consent of the Local Government Board was obtained, then immediately the consent was obtained proceedings might be taken at once, and that would deprive the alleged offender of an opportunity of showing cause before the Local Authority.

Mr. Justice Ridley said he did not think there was anything in the point. He thought the decision of the County-court Judge was quite right on the point, and therefore the appeal must be dismissed with costs.

Mr. Justice Bigham agreed, and the case was dismissed.

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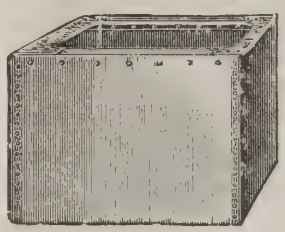

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2243.—SANITARY INSPECTORSHIP IN INDIA.—"Jack" writes:—"In THE SANITARY RECORD for June 13th there appeared an article on Sanitary Inspectors in Bombay. Would you kindly let me know when and where examinations for these posts are held for them? I hold the certificates of Sanitary Inspector and of Inspector of Nuisances; would they be equivalent?"

Answer.—We regret to say we can supply no further information than that contained in the paragraph in question. Our correspondent should write to the Health Officer, Bombay.

2244. — FACTORY INSPECTORSHIPS: QUALIFICATIONS FOR.—"W. O. T." writes:—"In your issue of May 16th, query 2195, you refer in your answer to queries in back numbers of THE SANITARY RECORD with respect to examinations for Factory Inspectors. The copies referred to are, however, it is now found, out of print. Could you please repeat the information given in the answers referred to?"

Answer.—We reprint the answer referred to by our correspondent on page 559.

2245.—BURGH POLICE (SCOTLAND) ACT, 1892: SUBSTITUTION OF WATER-CLOSETS.—"J. M. C." writes:—"My Local Authority has passed a resolution that all proprietors of dwellings within the royal burgh where ashpits and privies exist, whether they are a nuisance or not, must remove them and introduce water-closets; see Section 246 of the Burgh Police (Scotland) Act, 1892. I argued that (1) they must be a nuisance under Section 16, Sub-section 2, of the Public Health (Scotland) Act, 1897, or (2) their construction must be defective, and certified by the Medical Officer of Health to be prejudicial to health under Section 255 of the Burgh Police (Scotland) Act, 1892, and (3) that Section 246 of the Burgh Police (Scotland) Act, 1892, was for the purpose of compelling proprietors of property to provide sanitary conveniences where none existed. I also stated that each case must be dealt with as found. I was, however, overruled by the clerk. Will you kindly give me your opinion?"

Answer.—We are of opinion that the contentions of the querist cannot be supported. The Local Authority are enabled, under Section 246 of the Burgh Police (Scotland) Act, 1892, to require the owner of every house into which water has been introduced to provide, wherever practicable, a sufficient water-closet. The powers conferred by the section named are comprehensive, and differ from similar provisions in the Public Health (Scotland) Act, 1897, and the Public Health (England) Act, 1875, relating to the provision of water-closets.

2246.—SEWAGE FROM HOUSES OUTSIDE DISTRICT.—"Inquirer" writes:—"A builds a house a short distance outside the district of an Urban Sanitary Authority, and requests such Authority to allow him to connect his house drains to their main sewers. This request is refused for various reasons, but chiefly on account of the Local Authority having contracted with an adjoining landlord to receive the whole of their sewage — not exceeding a certain quantity — for a certain sum per annum. If a certain stated quantity is exceeded, the Local Authority are then bound to pay the landlord an extra sum per year. A has now given notice to the Local Authority that, under Sec. 22 of the Act of 1875, he intends to connect his drainage to the main sewer. Assuming that under ordinary circumstances he has the right to do so, can the Local Authority refuse their consent under the circumstances as stated above, or can you refer me to any decision given in the Law Courts, or a similar case arising under the same section? The matter is an important one, as many plots of land are laid out for building purposes just outside the district, and there are several villages within a short distance, the property owners in which might be disposed to avail themselves of the sewers in a similar manner, especially if sewage disposal works, which are already in contemplation, should be carried out."

Answer.—The owner A is entitled, under Section 22 of the Act of 1875, to connect his drains to the sewer of the adjoining Authority, but only on such terms and conditions as may be agreed upon between him and the Authority of such adjacent district, or, as in the case of dispute, may be settled at the option of the owner by a court of summary jurisdiction, or by arbitration in manner provided by Sec. 181 of the Act. For cases decided under the section see notes in Lumley's "Public Health" to Secs. 22 and 28. The Council should impose such conditions, as they consider necessary, and by agreement under seal prohibit the connection of additional drains to that of the owner in question. Other owners could only drain to the sewer of the adjacent Local Authority by separate drains laid down from each house to the sewer of the adjacent district. The drainage of a number of houses into one common sewer, such sewer to be connected to the sewer of the adjacent Authority, would be a connection of the sewers of one Authority to that of another, and could only be done by agreement under Sec. 28 of the Act of 1875, and with the consent of the Local Government Board.

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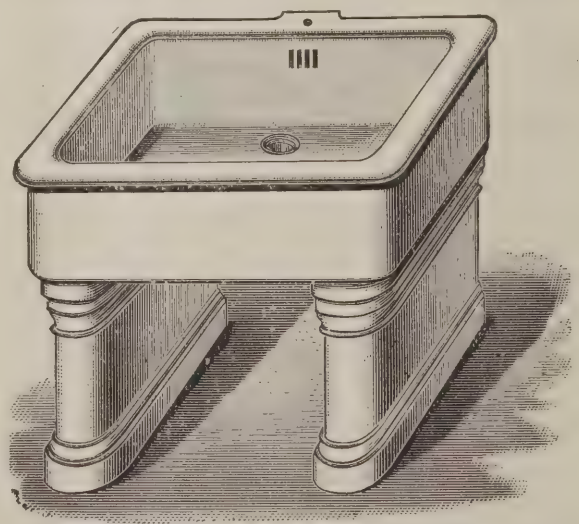

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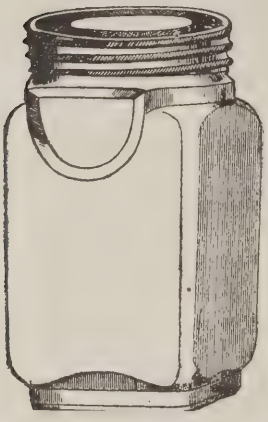

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THE OTHER SIDE OF THE QUESTION.

It is always well to look at both sides of a question; we therefore reprint from the *Liverpool Daily Post* the views of a medical man, which are opposed to those held by the majority of our readers. We invite correspondence on this important subject.

"ADULTERATION" OR PRESERVATION OF FOODS.

Life is, in these later days, made increasingly terrible by the work of the scientist and analyst, who discover in almost everything we eat, drink, wear, or breathe, something or other that is dangerous to health or life. We have ceased to wonder how our forefathers managed to exist (and thrive) on the myriads of germs they lived amongst, and the number of poisons they introduced into their systems by means of food and drink and air. They lasted a good deal longer, we must suppose, because they were wondrously tough, or on the principle that some people cannot be killed. But, though we owe a debt of gratitude to the workers who have exposed the numerous means by which foods and other articles of commerce are debased by inferior substances to the profit of the tradesman and the hurt of the purchaser and user, we are, I think, in some danger of making a natural desire for self-preservation degenerate into a craze and end in panic and foolish excess. There is all the difference in the world between taking care that we are not imposed upon by the substitution of sand for sugar or that of margarine for butter, and running amok at everything that can be safely utilised to ensure that foods shall reach the consumer and the consumer's stomach free from commencing decomposition. The addition to foods of preservatives is permitted by Act of Parliament, provided these are not added to an extent that can be considered excessive when the food is consumed in normal quantities.

I believe the Devonshire cream industry has been destroyed, as far as Liverpool is concerned, by the recent prosecutions for "adulteration" of the preparation with boracic acid. Here it is absurd to speak of the addition of a harmless antiseptic in small quantities as an "adulteration." Under the conditions of society at the present day, with enormous multitudes dependent on a constant food supply, and requiring this in convenient and varied forms, we shall have to face the problem of providing this, and providing it in a safe and reliable condition. This, I suggest, is impossible without the addition of preservatives, and the addition of preservatives should be recognised as necessary by Parliament, which should also state, after proper inquiry into the scientific aspects of the subject, what preservatives may be used, and in what proportions.

It is contended that antiseptics are not necessary; that foods can be put up in a sterile condition, as far as danger of germ infection is concerned, and the presence of decomposition. Allowing this, we are only protected as far as the consumer, not as far as the consumer's stomach. Your bottle of fruit wine, or condensed milk, or beef essence, or cream, is sterile and good when it is opened, but is it consumed at once? Rarely; for the thrifty housewife uses what she wants at the moment, and corks up the remainder, with the decomposing germ included, for future use. If you fine the manufacturer for adding preservatives to foods, you should look up the Health Authorities for preventing him making the wholesome addition, and permitting the unwary consumer to take foods which are in the early or later stages of decomposition, and which may be extremely dangerous to health, though the process of decomposition is not advanced sufficiently to be recognised by the usual domestic tests of smell and taste. In the meantime we are in danger of stretching the letter of the law to the bewilderment and confusion of her Majesty's lieges, who really don't "know where they are" in the midst of scientific alarms and Health Authorities' excursions. Take the Devonshire cream question. Milk we absorb in large quantities; it is old in a day, it is consumed as a matter of convenience and habit offhand, and it would be a fraud if foods understood to be, and bought as, fresh, and taken in these large quantities, were "preserved" by the addition of antiseptics, though these were harmless in small doses and when not taken in any excess, as they would be in a staple article of diet. But this does not apply to articles of commerce like cream, which is consumed in small quantities, and certainly in the case of Devonshire cream, not constantly, or, *e.g.*, products like margarine, known to be manufactured and necessarily preserved; or fruit syrup and non-alcoholic beverages which, however sterile to germ life when prepared and sent out, cannot long remain so when once opened. These require the addition of preservatives, and such as are commonly used in this connection are only deleterious when viewed from the standpoint of a vigorous scientific imagination, or if taken in such quantities that the preserved substance itself would prove harmful in. If we are to forbid these, we should forbid altogether the use of alcohol, which is much more certainly harmful and poisonous in excess than the preservatives used in foods. It is essential, therefore, to distinguish between foods bought as fresh, staple articles of diet, and those known to be manufactured and of necessity preserved. The question is one rather for the practising physician than the pathologist. The pathologist, grubbing in his laboratory, cannot be expected to have that practical familiarity with drugs and their effects on the human organism possessed by the physician, who is using them daily and hourly, and estimating their effect on the economy. We are not concerned with the pathologist's material—*e.g.*, rabbits and cats—as much as with that of the physician—human beings. I want to know if a drug is going to harm me, and, if so, what are the limits of safe consumption of it. I know that everything is poisonous if we take enough of it; and I know to my bitter cost, as many of us do, that there is no drug or poison so dreadful at times as decomposed foods, or that we suffer acutely or fatally, maybe from that which we cannot distinguish beforehand as becoming putrid. There is a scientific cant in these days, devised by the pathological ogre in his den, and followed too enthusiastically by those urgent for the public welfare. We must not, by avoiding the Scylla of adulteration, run into the Charybdis of decomposed foodstuffs. Let us know by due inquiry into all the grounds by competent and representative men—physicians and pathologists—what preservatives may safely be used. Let us find out the limits of safety; and let the blind prosecution of industries that are in themselves useful and convenient be conducted, not so much to assert a too rigorous theory as to promote the comfort and health of the community, understood in its widest sense.

HOW TINNED FOOD BECOMES DANGEROUS TO HEALTH.

Preserving food in tins is said to have been invented some ninety years ago. It is not such a perfect method of keeping food as is cold storage, but it is applicable under conditions where cold storage is practically impossible. On an exploring expedition, or for a military campaign, or under any circumstances where lightness of transport is an important consideration, the weight of a refrigerating machine effectively prohibits its use. It is very important, however, that great care should be exercised in every detail of the process of preparing tinned food, for if by any carelessness any mistake is made, the contents, instead of being wholesome food,

are often highly poisonous, and have frequently caused death. The *British Food Journal* says that there are two ways in which tinned food becomes dangerous to health. The first is by the growth of organisms, or, in other words, by the food becoming putrid, and the second by the dissolving of the metal of the tin or of the solder by the acid juices of the food. The prevention of the putrefaction can be absolutely ensured, but the risk of metallic poisoning can never be entirely done away with. The essential condition for the prevention of putrefaction is that the contents of the tins must remain at the temperature of boiling water for some twenty minutes; then, before the temperature is allowed to sink however slightly, the tins must be hermetically sealed in a thorough and efficient manner. If this process is done properly, there is no chance of the food becoming unsound unless the tin is damaged in such a way as to allow air to enter.

As regards the action of the juices upon the metals of which the tin is composed, one of the best precautions which can be taken is to only use solder which has been specially made for the purpose, and which has by long experience been proved not to be acted on by the food intended to be preserved, and to carefully test each boiling of the substance to see that the juice is not acid.

When a tin is purchased it should be examined externally before use. If the ends of the tin bulge outwards instead of being somewhat sucked in, the article should be rejected, for the tin is "blown;" the gases generated by the decomposition of the food have collected, and are exerting pressure on the tin. The dishonest manufacturer and dealer knows this sign of decomposition, and when the effect is noticed they prick the ends, and after allowing the gases to escape they re-seal the tin. Such tins are called "pricked tins," and the contents are often very dangerous to health. Such pricked tins usually have two dabs of solder on the end of the tin in place of the ordinary one. If this "pricking" be done cleverly, it is difficult to detect by outside inspection, and the odour and appearance of the food should always be very carefully noted when a tin is first opened. Any taint of decomposition, however slight, should be sufficient to condemn tinned food.

The only safeguard which anyone not a chemist can take to prevent being poisoned by any dissolved metals is to taste a little of the article, and carefully note if there is a metallic after-taste. If there is the sample should be rejected. All tinned food should be entirely removed from a tin and put into glass or earthenware vessels as soon as the tin is opened. If the contents are allowed to remain even for an hour or two in the tin, and exposed to the atmosphere, there is a great chance of the tin being partly dissolved, and consequently of a case of metallic poisoning occurring.

FISH UNFIT FOR FOOD.

DURING last month the officers of the Fishmongers' Company condemned as unfit for human food 61 tons 8 cwt. 2 qr. of fish at Billingsgate Market, representing 1 ton in about 209 tons, and 1 ton 4 cwt. at Shadwell, representing 1 ton in about 196 tons. The weight of fish delivered during December at or near Billingsgate Market was 12,869 tons, of which 10,845 tons arrived by land and 2024 tons were delivered by water; and at Shadwell the total delivery, 236 tons, was by land. Among the fish condemned were bream, catfish, cockles (6 tons 3 cwt.), cod (2 tons 4 cwt.), dorees, eels (18 cwt.), gurnets, haddocks (10 tons 12 cwt.), herrings (15 cwt.), ling, lobsters, mackerel, mussels (2 tons 16 cwt.), oysters (2 tons 8 cwt.), periwinkles (18 cwt.), plaice (9 cwt.), salmon, shrimps (3 tons 4 cwt.), skate (5 tons 10 cwt.), smelts (16 cwt.), soles, sprats (12 tons 19 cwt.), whelks (7 tons 5 cwt.), and whiting (3 tons 18 cwt.).

BOGUS MARMALADE.

SCOTLAND is discussing a question of great interest to eaters of marmalade. Mr. Thomas Jamieson, Public Analyst of Aberdeen, on examining twelve samples, found that while eleven were genuine, nearly one-half of the twelfth consisted of apples, and the person who sold this mixture contended that he had a perfect right to describe it as marmalade. He quoted the dictionary in support of his contention, and declared that he was perfectly entitled to use any bitter fruit in the manufacture of marmalade.

It seems that the term marmalade originated in Portugal. In that country marmalade was generally made from oranges, but sometimes quinces were used. Extending this view certain dictionaries define marmalade as being made from any kind of sour fruit.

Mr. Jamieson declined to accept the meaning given "by compilers of words" as representing the modern acceptation of the term, and Sir James Low, the head of a great Dundee firm of preserve manufacturers, on being interviewed, said that he had never heard of anything but bitter oranges and pure refined sugar being used in the manufacture of marmalade. If the public got anything else they were being certainly misled.

It appears that at present there is to be no prosecution, but the question is one of some importance to lovers of marmalade.

HOW BELGIUM DEALS WITH THE MARGARINE QUESTION.

A NEW law concerning margarine has just come into force in Belgium. The enactments are as follows:—

The term "butter" is reserved for fat obtained from milk or cream by churning, with or without the addition of ferments, colouring matters, or salts. Other alimentary fats resembling butter in their external characters, such as appearance, consistency, colour, odour, taste, are termed margarine.

Mixtures of butter and margarine for sale are prohibited. Margarine for sale may not contain more than 10 per cent. of fat derived from milk. It must be mixed with substances which, while being inoffensive and incapable of altering its organoleptic characters, will facilitate its distinction from butter. Particulars of these substances will be given later in a royal decree.

Produce destined for direct export is exempted from these provisions if declared prior to manufacture.

Margarine must be delivered from a manufactory or wholesale dealer in vessels bearing the word "Margarine" on every face, in letters at least $\frac{4}{5}$in. high, with the name and address of the firm.

Butter and margarine may not be sold on the same premises, and butter merchants or producers may not keep margarine even for their personal consumption on premises where butter is sold.

All shops where margarine is sold, as well as vehicles serving for peddling margarine, must bear the words "Sale of margarine" in distinct type at least 8in. high, and clear of all inscriptions. In market places margarine may only be sold at spots specifically indicated by the communal authority, and at least 25 yards from any butter-stall.

All vessels or wrappers in which margarine is sold must have the word "Margarine" in letters distinctly visible to the public, at least $\frac{4}{5}$in. high and clear of all other matters, as well as the name and address of the seller. If sold in blocks, these must be cubical in shape and marked in a similar manner.

Abnormal butter, *i.e.*, butter of which the characteristics differ from those of most pure butter, without exhibiting clearly adulteration or serious alteration, may

not be sold. A royal decree will specify the physical and chemical indications by which these characters may be recognised.

UNSATISFACTORY METHODS OF FOOD INSPECTION.

"In England it is safer to poison a man than to damage his trade," is the alarming statement made by Mr. W. Stanley Shaw in a communication on adulterated foods.

"This was proved the other day," he continues, "when an intelligent British jury awarded a firm of food manufacturers heavy damages against a morning paper which had published a paragraph concerning their productions. I believe it to be no exaggeration to say that half the people in London are, in some form or other, using unwholesome food. The sale of adulterated milk, diseased meat, bad beer, and very doubtful tinned or potted foods, flourishes like the green bay tree. Nor is it to be wondered at. Look at the difficulties that lie in the way of any ordinary ratepayer who is the victim of this state of things, and who wishes to take steps to protect himself! It is easier for a tradesman to poison a ratepayer, than for a ratepayer to stop the evil practices of a tradesman.

"This is an unsatisfactory state of things. Food adulteration should be punished more severely than it is, and the sale of unsound and diseased foods should be punishable by imprisonment. Nor should the retailer be made to bear the brunt. The wholesale merchant and the manufacturer should be made equally liable.

"As regards Inspectors, how can one man or two men combine the duties of Inspectors of Nuisances, Dairies Slaughter-houses, Petroleum, &c., and attend to four or five other duties as well for a district with a population of 200,000 or 300,000 people? It becomes a farce! What is wanted is a properly-qualified, properly-paid staff of men to thoroughly watch the interests of ratepayers who can individually spare neither the time nor the expense to do it for themselves."

Sugar by Electricity.—A new process of sugar refining is said to have been invented by a French firm. This consists in using electricity and manganate of lime in the clarification of the juice. Zinc plates are inserted in a series of tanks containing the liquid with which manganate of lime has been mixed. A current of electricity is then passed through the tanks. The new process is said to have the merit of cheapness, and by its adoption a considerable reduction in the price of sugar is promised.

CASES IN COURT.

[Records of Police-court proceedings for insertion in the "Food and Health" Supplement should reach us not later than the 10th of the month. Generally speaking, they should be as brief as possible, but where any important point of law is involved a fairly full report is permissible.—Ed. S. R.]

Water in Butter.

An appeal was recently argued before the Preston Quarter Session, the decision in which is of importance to provision merchants, farmers, and dairymen throughout the British Isles. The question at issue was the limit of water that should be allowed to remain in butter. The appeal had been suspended for some considerable time, because it had been expected that some commission would be appointed by the Board of Agriculture for fixing the standard of water, but an intimation had been received that no such fixing of the standard was likely to take place at present.

The appellants were the Peace and Safety Industrial Society, Limited, of Rawtenstall, who had been convicted by the Rossendale justices of having sold, to the prejudice of the purchaser, a pound of butter not of the nature, substance, and quality demanded by the purchaser, inasmuch as it contained 19·30 per cent. of water, contrary to Sec. 6 of the Food and Drugs Act, 1875. As the question affected the whole of the Irish salt butter trade, which exports to the value of nearly three millions sterling annually, a large number of eminent analysts, butter manufacturers, and merchants of considerable experience in home and foreign butter-making were called to speak as to the process employed in the Irish homesteads in the manufacture of Irish salt butter. It was pointed out that it was impossible to make Irish keeping butter to come within the maximum of 15 to 16 per cent. of water which is being established by the public analysts of the country, and that its manufacture necessitated the employment of brine, as opposed to dry salt, which the respondents held (though it was denied on behalf of the witnesses for the appellants) would give the effect required.

The appeal was allowed and the conviction quashed, the Bench being of opinion that the purchaser, having demanded Irish butter, got what, according to the ordinary use of the term, he might reasonably expect to get.

Both the appellants and the respondents agreed on the great desirability of some authoritative standard or standards being fixed. One suggestion was that there should be two standards, one for the creamery butter and one for the more heavily-salted butter known as Irish. Having regard to the magnitude of the interests

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involved to producers and consumers alike in the trade of butter imported from Ireland, and to the fact that there were two distinct classes of butter imported, and that it was desirable to prevent as far as possible confusion between them, it was the unanimous opinion of the Court that the question of fixing a presumptive standard or standards merited the early attention of the Board of Agriculture.

Diseased Meat in Edinburgh.

At a special sitting of the Edinburgh Police-court, held in the Sheriff-court Buildings, Sheriff Orphoot had before him two cases under the Public Health Act. The first case was that in which John Wyllie, cow dealer, residing at Fishbeck, Lockerbie, was charged with being the owner of four quarters of diseased beef intended for human food, which were conveyed to the Edinburgh slaughter-house, Fountainbridge, on December 3rd last. Accused pleaded not guilty.

John Riddock said the meat was dark in colour, and appeared to be that of an animal slaughtered while in a highly fevered condition. It had been taken to the Central Meat Market, but was refused admission. Witness admitted in cross-examination that the meat might be affected in a two days' transit.

Mr. James M'Phail, Veterinary Inspector, corroborated.

Dr. Williamson said he found the meat was dark in colour and soft in consistence. It appeared to him to have been the carcase of an animal in a feverish condition. He did not think there would be any appreciable difference in the meat by a two days' transit.

For the defence, Dr. Mitchell Watson, veterinary surgeon, Kirkcudbright, was examined. His evidence went to show that when he saw the carcase it had no symptoms of disease, and the meat was firmly set. The evidence of respondent was to the same effect.

The case was at the close of the evidence continued, in order that another witness, who was a veterinary surgeon, and unable to be present, might be heard.

The second case implicated Harry Q. Mitchell, farmer, residing in Newbiggin, Burntisland, Fife. He was charged with sending a live cow to the sale yard of Oliver and Son, in Valleyfield-street, Edinburgh, on December 11th last, which was diseased and unsound for human food.

Accused pleaded guilty, but on his behalf it was stated that when examined the cow was thin, but gave no cause for the suspicion that it was suffering from tuberculosis. He, however, did not take the proper precautions, but had no idea of the animal's condition.

The Sheriff said he thought the decisions given in that Court would have prevented the sending of diseased animals into market. But for the Inspectors discovering the condition of the cow it would have been used. He therefore would inflict a penalty of £10 and expenses.

Unsound Meat at Aberdeen.

In Aberdeen Police-court an important prosecution was brought against James Milne, senior partner of the firm of Messrs. Alexander Milne and Sons, preserved provision manufacturer. It was alleged that accused, as a partner of the firm, had in his possession for sale or in preparation for sale 1382 lb. of meat, all of which was unfit for human consumption. A plea of not guilty was tendered. Accused was defended by Mr. G. M. Aitken, Solicitor.

Kenneth Cameron, Sanitary Inspector, stated that he visited the works of the Messrs. Milne on December 21st, and examined several pieces of meat, forming one whole carcase, and nearly the whole of two other carcases, and the part of a fourth carcase. The sixteen pieces he seized were either tubercular or the meat was soft and flabby. All the meat seized showed unmistakeable signs of being unfit for human food.

Dr. Matthew Hay, who had accompanied the Sanitary Inspector on his visit, corroborated, and stated that the unfavourable symptoms must have been more apparent to the killer than to Mr. Cameron and himself, because measures had been taken evidently for the purpose of concealing these symptoms.

Matthew Donald, Assistant Sanitary Inspector, deponed as to the lining membrane being stripped off, obviously with the intention of obscuring the presence of the disease. Witness denied that two months ago Mr. Milne requested him to permit nothing but good meat to be transferred from the market to his premises.

George Wood, cattle dealer, was the first witness for the defence. In answer to Mr. Aitken, witness stated that he supplied the best of meat to the Messrs. Milne. The supplies to that firm amounted in value to between £400 and £500. Alexander Scott was in his employment, and killed all his animals. The carcases were delivered at the Messrs. Milne's business premises. He always purchased healthy animals, and paid a fair price. The four animals whose carcases were condemned were killed on the December 20th. Messrs. Milne paid a full price for good meat at the rate of 4¾d. to 5d. per lb., and taking very large quantities. In reply to the Fiscal, witness admitted having been three times convicted for having meat unfit for human food.

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Sons, said he had special charge of the meat department. They had two practical butchers in their employment for the purpose of seeing that no bad meat came through their hands. He understood that the meat had passed the Inspector at the market, and that it was absolutely sound. His men had not had time to inspect the carcases, but would have done so before the meat was used.

Alexander Scott, who killed the animals in question, said he knew the meat was diseased. He did not inform either Mr. Wood or Messrs. Milne. He thought it best for his master's interests to take up the meat to Messrs. Milne. He gave instructions that the carcases should be carried in so that the disease would not be seen when the meat was put on the scale.

In reply to the FISCAL, witness said he took out the glands and the lining membrane to hide the tubercles. He was only carrying out his instructions.

The FISCAL: You knew you were doing what was wrong. If your employer asked you to go and steal something for him, would you do it?—Well, I don't suppose I would. This is a different matter.

The FISCAL: Then it comes to this, that it does not matter how bad your instructions are, you will carry them out because it is part of your employment?—Quite so.

The FISCAL: Did you ever take such instructions before?—No; this was the first time.

The FISCAL and Mr. AITKEN having addressed the Bench, the magistrates retired.

On returning, Bailie HENDERSON said they had very carefully considered this case. They were of opinion that Mr. Milne's method of inspection was not what it ought to be, and with reasonable care the condition of the meat could have been found out. A fine of £10, with 24s. 6d. of expenses, was imposed, the alternative being twenty-one days' imprisonment.

Arsenic in Beer.

THE Sanitary Committee of the Manchester Corporation last week took action against twelve beer retailers, who it was alleged had sold beer which contained arsenic. The summonses were taken out under the Food and Drugs Act, and defendants were charged with supplying beer not of the nature, quality, and substance demanded by the purchaser. There was a crowded attendance at the City Police-court. Mr. T. F. BYRNE appeared on behalf of the prosecution, and Mr. FLETCHER MOULTON, Q.C., M.P., and Mr. C. P. MCKEAND represented the defendants. M. J. HISLOP watched the proceedings on behalf of the Manchester and Salford Beer and Wine Trade Association.

The first case taken was that against Elizabeth Goulder, beer retailer, of Hulme. Mr. BYRNE, in opening the case against the defendant, said the Inspector called at Mrs. Goulder's licensed premises on November 21st and saw the defendant's niece, who, for the time being, had the management of the house. He asked for a quart of fourpenny beer. Defendant's niece fetched it from the cellar. A portion was sent to the Public Analyst, Mr. Estcourt, for analysis. Mr. Estcourt certified that it contained arsenious acid to the extent of one-eighth of a grain per gallon. The prosecutor contended that the presence of any quantity whatever of arsenic in beer made it not beer of the nature, quality, and substance demanded, but made it beer mixed with a drug, and a dangerous drug, too, which had no business to be there.

Mr. Estcourt, in reply to Mr. FLETCHER MOULTON, said he had received warnings as to the presence of

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arsenic in beer. Witness did not suggest that any blame could attach to the defendant for the presence of the arsenic in the beer. It was not specially difficult to detect the presence of arsenic in beer. The quantity of arsenic referred to in the charge, viz., one-eighth of a grain per gallon, roughly speaking, represented a proportion of one part in half a million. In his private practice as an analytical chemist he had never heard hitherto of an analyst looking for the presence of arsenic in beer.

Dr. James Niven, Medical Officer of Health, stated that arsenic ought not to be taken except under the most careful medical supervision. People differed in susceptibility, and seven-eighths of a grain per week would be injurious when taken for some time, and would produce disease such as had been observed in the hospitals. He had been in practice twenty years, and during that time it had never occurred to him to suspect arsenic in beer, though he had examined beer. He would not commit himself to the assertion that no one had up to that time ever suspected or known of the presence of arsenic in beer in minute quantities. In his own experience he had found that the great majority of beers subjected to analysis contained glucose obtained from one particular firm. The effect of small percentages of arsenic in beer would be deleterious on account of the quantity consumed. In further explanation he added that in a population of 40,000 people who drank beer an individual might be found here and there who would be susceptible to injury from the practice of consuming the beer.

Mr. Fletcher Moulton, in addressing the Court, remarked that the summons in this case ought not to have been taken out under Sec. 6, but under Sec. 3, which dealt with what he might call contamination. That was to say, that there was added to the article asked for something which was a hurtful contamination. Sec. 6, he contended, dealt entirely with adulteration; that was to say, where an article sold was not the article asked for, but an article which had been so manipulated that the purchaser did not merely get a contaminated or uncontaminated but an entirely different article. Commenting on the case generally, he said the world had learned a terrible lesson with regard to the possibility of arsenic being present in food, and the source of danger to the public was now being destroyed for ever. He admitted the gravity of arsenic being found in beer in such quantities, and said that after this the avenues by which such contamination could creep in would be effectively closed, and in future they would hear no more of it.

Mr. Byrne, in replying to Mr. Moulton's argument, said that an offence under Sections 3 and 4 of the Act was one matter, and a much more serious matter for the retailer than an offence under Section 6. To sell an article knowing it to be impregnated with a dangerous or injurious substance was a very serious offence, meriting a serious punishment. Section 6, however, applied expressly to the retailer, and to no one else.

The decision in this and other cases was adjourned for three weeks.

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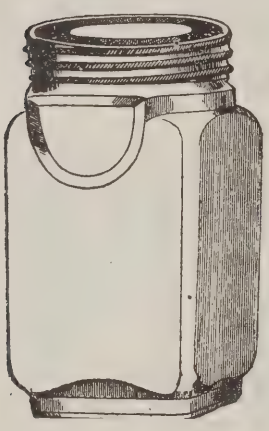

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GLUTEN FLOUR AND BREAD.

By Martin Priest, A.I.C., F.C.S., and William Partridge.

Several samples of gluten flour have recently come under our notice in which starch was present to the extent of over 50 per cent. Recollecting the warnings put forward about two years ago by Dr. Fielden in the *Pharmaceutical Journal*, and also an article in the *British Medical Journal* on "The Chemistry of Diabetic Foods," it is surprising to find still upon the market a large number of such so-called gluten flours.

As this is a subject which vitally concerns the health of diabetics, and yet receives so little attention from members of the medical profession who have the dieting of diabetic persons, we do not wonder that many bakers and manufacturers of diabetic foods take advantage of this inactivity and place upon the market with impunity forms of diabetic food which contain so large a percentage of starch as to be fatal to the successful treatment of the disease.

Patients, too, ignorant of this fact, consume as much as they think fit of these fictitious gluten breads, taking it for granted that starch and sugar are both absent from the preparations, often doing themselves more harm than if they took normal quantities of ordinary bread.

There appear to be great differences of opinion as to the proper definition and composition of gluten bread. Those concerned with its manufacture generally state that it is composed solely of gluten except for a little fat which is left in by some methods of preparation. On the other hand, many medical and chemical authorities on the subject think that bread composed entirely of gluten may often be advantageously replaced by a preparation retaining one-fifth or one-sixth of the starch of the flour incorporated with it.

Pure gluten bread frequently fails to satisfy the craving which diabetic persons possess for starchy matters which is greatly increased by total prohibition of starch, and preparations made solely from gluten are in addition hard, brittle, and usually have an unpleasant doughy taste. This being so, in cases of mild diabetes, where patients respond to treatment, gluten breads containing a small percentage of starch might be found valuable.

We see that certain manufacturers advertise their bread as retaining a certain percentage of the original starch, and we think that this practice might be carried a step further, and different grades of bread containing varying amounts of starch should be prepared, each loaf to possess a label indicating the percentage of starch, so that medical men may alter the composition of the diet in accordance with the requirements of the case. But the amount of the bread should most certainly be regulated, as harm is done if excessive amounts, containing even a small proportion of starch, be taken by the patient.

Not only gluten bread, but diabetic foods generally, need revision to a large degree, as very erroneous ideas as to the composition of the different foods are prevalent. Cownley (*Pharmaceutical Journal*, 1898, ii., page 327) points this out in a list of such so-called gluten articles, which he showed to contain very varying and in most cases large percentages of starch.

Where any doubt exists as to the composition of purchased bread, suitable bread may easily be prepared at the patient's home, which has the advantage of ensuring that the patient obtains it in a fresh condition. For its preparation Dr. Gordon Sharp (*Pharmaceutical Journal*, 1898, page 363) advises that the flour should be washed until nearly all the starch is removed, and then mixed with bran and made into a loaf. He also mentions that oatmeal washed for several hours, and then served with cream, will be found a valuable article of diet for diabetics. A suggestion for preparing diabetic milk will be found in *British Medical Journal*, 1898, ii., page 190, and a preparation of curds is described on page 932 of the same volume.

For the separation of gluten from flour several processes may be resorted to. A centrifugal method is mentioned in *Journal* Society Chemical Industry, 1900, page 918; but the simplest, and perhaps the most reliable, is the following:—A strong flour is made into a stiff dough with water only, and allowed to stand for nearly an hour, and then carefully kneaded in small portions at a time. The starch escapes in a milky solution, leaving the gluten behind as a soft sticky mass. When the washing water becomes clear it shows the absence of starch. If the gluten be washed in running water it will retain a little fat, but will be free from starch and sugar. The kneading under water is most conveniently done in muslin bags.

Gluten is also produced as a waste product in the manufacture of starch, but in this case the full value of the gluten is not always obtained. The "sour" process is an example of this, which is carried on in the following manner:—The grains having been coarsely ground, are moistened with water and allowed to stand for a few days until fermentation sets in, when more water is added, and the putrefactive fermentation continues for several weeks, until all the gluten is dissolved. The latter is then washed out of the starch. Obviously here, there is some loss of gluten at whose expense the fermentation goes on.

Another process, which is used chiefly in the case of rice and maize grains, is based upon obtaining the solution of the gluten in a 3 per cent. solution of caustic soda, the starch granules being insoluble. The gluten being afterwards precipitated by an acid. Gluten is generally baked in the form of small rolls or buns, which swell to an enormous extent during baking, and the section of such a loaf shows large empty cavities. The proportion of gluten in flours varies from 8 to 18 per cent., the average being about 12 per cent. To get a flour rich in gluten the soil should contain a sufficient but not excessive amount of nitrogen. A hard wheat (yielding a strong flour) contains more gluten than a soft wheat. Gluten constitutes a most valuable part of wheat flour, and is an extremely valuable foodstuff. As prepared by washing flour till free from starch, it is an adhesive, sticky, elastic, mass with a brownish or greyish tinge, but when freed from water it is translucent and colourless, and it is said that about 96 per cent. of such gluten is digestible.

Gluten is not a definite substance, but is composed chiefly of gliadin, glutenin, and soluble salts. Different authorities disagree as to the number of proteids contained in it; for example:—Ritthausen states that by extracting gluten with dilute alcohol he obtained three proteids gluten-fibrin, plant-gelatin, and mucedin; but Osborne and Vorhees (*American Chemical Journal* xv., No. 6) come to the conclusion that only one proteid soluble in dilute alcohol exists, viz., gliadin, and one proteid insoluble in dilute alcohol called glutenin.

Gliadin has appeared before the scientific world in different states of purity and under different names, as plant-gelatin, mucedin, mucin, and gluten fibrin. It was first called gliadin by Taddei on account of its resemblance to glue. It is soluble in dilute alcohol, but insoluble in absolute alcohol. It is slightly soluble in cold water, but the presence of salts greatly lessens this solubility. It is also soluble in very dilute acids and alkalies. In the hydrated condition gliadin is a soft, sticky substance. With cold water it acts as a binding material and makes the gluten tough and coherent.

Glutenin in the pure form is a greyish-white, non-sticky mass. On drying at 100 deg. it forms a slightly brownish horny material. It occurs in wheat grain to the extent of 4 to 4·5 per cent. It is insoluble in dilute alcohol, water, and saline solutions, but soluble in dilute acids and alkalies. It has appeared under the names of zymom, plant-fibrin, gluten-casein, and gluten-fibrin.

Gluten owes its solidity to the glutenin, which forms a nucleus to which the gliadin adheres, and thus prevents it being washed away. Gluten also contains a slight amount of mineral matter, chiefly soluble salts, which prevent the gliadin dissolving. The estimation of gluten in flour may be effected in several different ways, the simplest being to wash the starch away from the flour and weigh the residual gluten, but as the results obtained vary with the amount of washing, length of time of standing, &c., it is desirable that the flour should be mixed with a certain amount of water, allowed to stand for a definite time, and so forth. Variations of this process are given by Allen ("Commercial Organic Analysis," vol. iv., page 76) and by Wanklyn and Cooper ("Bread Analysis," page 43). In the latter method the authors make corrections for the ash (0·3 per cent. on the flour), and for the fat (1 per cent. on the flour.) Gluten may be estimated in flours, breads, biscuits, and other preparations by estimating the total nitrogen either by Kjeldahl's process or by a combustion of a small quantity of the substance with copper oxide and then multiplying the percentage of nitrogen by 6·33, which gives the percentage of gluten.

On the principle that vegetable substances generate ammonia when subjected to the action of a boiling solution of potash and potassium permanganate, Wanklyn estimates the gluten in flour by a modification of his well-known ammonia process in water analysis. L. Reed (*Journal* Chem. Soc., 1884, A, page 122, and *Chem. News* xl., page 63) describes a colorimetric method of estimating the gluten in flour based on the principle that nitric acid acts on albuminoids to produce a yellow nitro-compound. The flour is systematically treated with colourless nitric acid, and the colour produced is compared with that produced by a standard flour.

For the estimation of the starch, Fielden converts 2 grammes of the flour with 20 c.c. of sulphuric acid and 200 c.c. of water for three or four hours, neutralises the liquid with caustic soda, and estimates the sugar by Fehling's solution, and returns the result as percentages of sugar and starch together.

ARSENIC IN BEER AND FOOD.

"ARSENIC in Beer and Food" was the subject of a lecture by Mr. William Thomson, delivered before the Society of Arts. This poison, he said, was in very limited use in the arts and manufactures. It was mixed with lead in the manufacture of small shot, being necessary to produce perfect spheres. Arsenic was, therefore, one of the constituent parts of game, and a considerable dose of this poison was taken when a small shot was accidently swallowed by a person partaking of game. Fortunately, however, in this condition arsenic was not easily acted upon by the juices in the stomach. From 6000 to 10,000 tons of arsenic were annually used in Great Britain, principally in Devonshire, in making metal buttons, as when polished, it took a brilliant silvery lustre. Soot contained a large quantity of arsenic, coming presumably from the pyrites or brass-like pieces which were found in coal. One sample which he examined contained $1\frac{1}{2}$ grains to the pound, or $22\frac{1}{2}$ maximum medical doses. Arsenic must almost be regarded as having been a natural constituent of beer from the method of drying malt during the past century. Sprouting barley was dried in rooms which were heated by means of fires kept up with coke and anthracite coal. Arsenic was emitted from coke and coal fires even when there was no smoke. The danger consisted in the fact that it condensed upon the grains of malt. Out of 62 samples of malt which he had analysed, only seven were free from arsenic, the rest containing from $\frac{1}{200}$th to $\frac{1}{17}$th grain of arsenic trioxide to the pound. In the latter case it would represent nearly $\frac{1}{4}$th of a grain to each gallon of beer—a serious amount. Anthracite coal contained from $\frac{1}{100}$th to $\frac{1}{200}$th of a grain of arsenic per pound, while in coke there was from $\frac{1}{3}$rd to $\frac{1}{100}$th grain per pound. Of 220 samples of beer which he had analysed, twenty-one were free from arsenic, and the rest contained from $\frac{1}{200}$th to $\frac{1}{8}$th of a grain of arsenic trioxide per gallon. Taking the average of these samples, considerable quantities of beer would have to be drunk before even the minimum medical dose of arsenic would be swallowed. It might be suggested that minute quantities of the most powerful poisons, such as strychnine, acted as excellent tonics, but there was no record in which these poisons had been taken over a period of years as articles of daily consumption. Dealing with sulphuric acid, he said that immense quantities were made from Spanish copper pyrites, and as a result this acid usually contained as much as 0·2 to 0·4 per cent. of arsenic, and one sample of acid used in the manufacture of sugar contained 1·4 per cent.

Sir Lauder Brunton said he had had some personal experience of arsenic poisoning. His house had been newly done up, and he discovered arsenical poisoning symptoms in himself. He was assured that the wall paper was free from arsenic, but in his own case analysis showed that it was absolutely loaded with this deadly poison.

ANTISEPTICS IN FOODSTUFFS.

THE sentiment of physiological chemists is perceptibly changing of late with regard to the use of antiseptics in food, some authorities even going so far as to sanction their use to a limited extent. Many recent experiments in artificial digestion made by Chittenden, Leffmann, and others, on the toxic effects of formaldehyde and other antiseptics, which were considered almost in the light of poisons a few years ago, have tended to show that some of these antiseptics, far from being harmful, may be even helpful in certain of the digestive processes. Much interesting work is being done at the present time along this line. With such encouragement there is little wonder that the use of antiseptics is on the increase, though at present it is an open question how far their use should be allowed in food.

SOME OF THE PROPERTIES OF OYSTERS.

OYSTERS have for centuries been much esteemed by medical men as being very nutritious and easy of digestion, but both these properties are much diminished when not taken in their raw state. It may not be generally known that the fluid which surrounds the oyster bears a closer analogy to the gastric secretion than anything else in nature. In addition to the solvent properties of this fluid, it is not without its nutritive properties. We have of late devoted considerable attention both to the substance and the secretion emanating from it, and find that in a given weight of the latter and the same of the oyster, the fluid yields only 40 per cent. less of animal gluten or jelly than the fish; consequently all persons who are accustomed to eat oysters should be ever mindful that as little as possible of the juice should be lost. To effect this purpose they should always be opened in the bottom shell. When oysters are either stewed or scolloped the two properties, as before stated, are much diminished, consequently, ought not, by invalids in particular, to be taken except in their raw state.

ARSENICAL POISONING BY BEER.

Dr. Buchanan has issued his report to the Local Government Board on the recent epidemic of arsenical poisoning attributed to beer in the Midlands. It is of a preliminary and inconclusive character, in view of the appointment of the Royal Commission to inquire into the whole matter, and it does not encroach upon the field of inquiry of the Commission, which is of a wider and more strictly scientific character, to serve as a possible guide for legislation. The report, however, summarises concisely the leading features of the epidemic, and the conclusions arrived at as the result of the investigations. These have been largely anticipated by the report of the Manchester Committee of inquiry, as well as by the findings in the various coroners' inquiries in Manchester, which are now so much a matter of public knowledge that it is not necessary for us to traverse Dr. Buchanan's official report. The cause of the recent epidemic may now be held to have been satisfactorily established. It was due, as Mr. Long stated in the House of Commons, "to the substitute supplied by one manufacturing firm, into which this poisonous matter—arsenic—had got, owing to carelessness so extraordinary that it was difficult even now to realise how such a thing could have happened." With the discovery of the cause, the epidemic was at once arrested, though it cannot even yet be said to be at an end. The loss entailed on the brewers must have been enormous, for beer which was discovered to be arsenical was poured by hundreds of gallons into the sewers. All this loss, of course, comes back upon the Messrs. Bostock, of Liverpool. Not only are the claims against them by brewers, for the value of beer destroyed, enormous, but they have £100,000 worth of sugar on their premises, which is quite useless, as it is contaminated with arsenic. The result has been to force the unfortunate firm into liquidation. Meantime, Mr. Chaplin, Sir Cuthbert Quilter, and the advocates of the agricultural interest in Parliament are not content to await the report of the Royal Commission, but insist on legislative action being taken forthwith. Such haste must be deprecated. Panic legislation is never wise, and in this case there is no occasion for the panic that Mr. Chaplin's speech on the Address would indicate. Mr. Long had no difficulty in pointing out that, so far as the recent epidemic was concerned, the tracing of it to a single definite source, and its arrestment there, practically brought to an end any immediate danger, and it would be most unsafe and inexpedient to propose legislation without the solid foundation of scientific fact, which can alone be afforded by the report of the Royal Commission. But the anxiety of Mr. Chaplin and his friends, it is manifest, is not on account of the public health, which is Mr. Long's sole object, but to protect the barley grower.

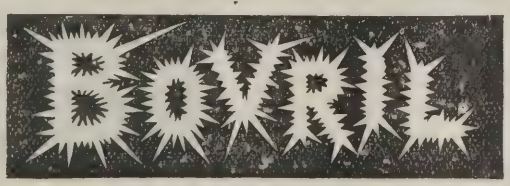
ALE AND BEER IN THE SIXTEENTH CENTURY.

The composition of ale and beer, says the *Lancet*, has always been of interest to members of the medical profession. Dr. Andrewe Boorde, who lived in the reign of Henry VIII., gives a full account of the composition of most of the beverages which were in use in his own time. He considered that water was not "holsome sole by it selfe for an Englysshemen" because it was "colde, slowe, and slacke of dygestyon." Ale, he said, for an Englishman was the natural drink. It was in his time made of malt and water fermented by yeast. It had, in his opinion, to be fresh and clear, not ropy or smoky. It appears to have been drunk very shortly after it was made, for he says that it ought not to be drunk under five days old, and that new ale was unwholesome for all men. He observed also that sour ale was good for no man, an observation which has been confirmed by subsequent experience. Contrary to the opinion of some modern brewers, he considered that barley malt made the best ale. He confessed, however, that in spite of its good qualities the beverage engendered gross humours, but he added that it made a man strong.

In his description of the composition of ale no reference is made to hops, and it appears that they were not used in the drink which he called ale, for he looked upon other ingredients, except those which he mentioned, as being adulterations. The composition of beer was different. It was made of malt, hops, and water, and was, he observed, the natural drink for a Dutchman. Of late days it had indeed been used in England, but unfortunately with detriment to many Englishmen, and it was especially harmful to those who suffered from colic, "for the drynke is a colde drynke," he observed. Yet, he said, it made a man fat—a point on which the observer could satisfy himself by examining the faces and other parts of the persons of Dutchmen. The beverage had, however, one good point, which was that if it were well served in good condition, and not new, it qualified the heat of the liver. Dr. Boorde was a great traveller, and amongst other things he especially noticed the condition of the food and the drink in all the places which he visited.

Of the ale of Cornwall he formed a very low estimate; it looked white and thick, "as if pygges had wrastled" in it, and he gives some unsavoury particulars as to the ill-effects of drinking this beverage into which, perhaps, it is hardly necessary to follow him. In Boorde's time it does not appear that Scotland was celebrated for good ale as a general rule. Although fish and flesh were to

Over Five Hundred Hospitals



IS LIQUID LIFE.

and kindred public institutions, including all the most important in the United Kingdom, are regular users of Bovril. Such a practical public endorsement is conclusive evidence of the absolute purity of Bovril, and of its great value as a *nourishing* stimulant in convalescence.

be had there in plenty, the ale, he says, was evil, with the sole exception of that brewed at Leith. Dr. Boorde was extremely severe in the punishments which he thought should be meted out to brewers of bad ale and to those who gave short measure. He gave it as his opinion that they ought to be placed in the Thames up to their chins and 3in. above, and suggested that when they came out they would have to shake their ears as a spaniel that verily came out of the water. Dr. Boorde devotes one chapter of his book to soups, stews, and other articles of diet which would now be classified under the general heading of invalid food. Amongst his recipes he recommended ale brews and caudles for weak men who could not eat solid meat. In many country districts these old-fashioned compositions are still used and sometimes perhaps with satisfactory results.

PERSONAL AND PUBLIC HEALTH.

THE third of a series of Health Lectures was recently delivered by Dr Andrew Wilson at Barrow. The lecturer pointed out that there are three essentials to life—first, food; second, water; third, air. Without food and water an ordinary human being would live a week; supply a man with water alone and he would last twenty, thirty, or even forty days. But without air we could live only a few minutes. We spend money and take a great deal of trouble to get food; our corporations spend enormous sums in order to supply the towns with water. What provision do we make for getting air, which is most necessary for life? He answered, no provision at all. It was nothing short of a disgrace that at the end of the nineteenth century we have no scientific system of ventilation at all generally adopted. Proceeding, Dr Wilson dealt with the nature of the breathing process as illustrated in low life and in higher animals, and then described the lung, its structure, its air cells, its blood supply, the relation of the lungs to the heart, the physiological trio—lungs, skin and kidneys; the work of getting rid of waste, and how the lungs play their part in this work, breathing and its mechanism. Coming to the air we breathe, its composition, its purities and impurities, the lecturer pointed out the absolute necessity, in the interests of public health, of a universal knowledge of the laws of health. And could he rule, he said he would instruct every child in the country before he or she left school—where he would keep them longer than some of them remained even at the present day—he would instruct every child in the laws of health; greater attention should be paid to the health of their bodies, and each and everyone should go through a course of physical exercises. Putting down his pointer with which he had been drawing attention to the lantern illustrations, Dr Wilson addressed the audience very earnestly upon the all-important subject of consumption, every case of which, he said most emphatically, is one of infection. As a precaution against consumption he urged the public to boil or sterilize the milk bought for consumption. He hoped to see the day when municipalities will sterilize the milk for us, but it would be far better to have an intelligent nation thinking these things out for themselves. Consumption did not begin with a cold, but a cold weakened the lungs, and so rendered them more susceptible to the microbe or germ of the disease; 20,000,000 of these germ were coughed up by a consumptive man in one day. Hence the necessity for great care. Consumption, he assured his hearers, could be prevented, and he urged them to do all in their power to enlighten themselves and others upon this most important subject. He proceeded to give a word of warning against tight-lacing amongst women, demonstrating on the screen the very manifest deformity caused by these attempts at a false ideal of beauty. In conclusion, the lecturer again dwelt upon the importance of pure air, and made an eloquent appeal to the people of Barrow to continue their interest in the Gilchrist lectures, in order that they might be followed by a continuation course.

HOW ARSENIC GETS INTO MALT AND HOPS.

MR. C. ESTCOURT, official Analyst for Manchester, has dealt with this matter in an interview with a representative of the *Daily Mail*:—

The explanation is simple, he said. When the malt has completed growing it is damp and moist. If it were allowed to remain in damp it would become mouldy and grow again. The desire of the maltster is to check that. The malt is, therefore, thrown on a kiln and subjected to heat from coke or steam coal, and it comes into absolute contact with the fumes of the fuel. It follows, therefore, that if the coal or coke contains arsenic the malt becomes impregnated with the poison. Of course the amount of arsenic in coal varies. If it were always to be found only in very small quantities there would be nothing to make a noise about; but I say the method of drying does not permit one to control the quantity. Again, the arsenic may increase according to the length of time the malt is heated.

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process of drying, but to my astonishment a brewer who had eliminated, as he supposed, all impure materials and brewed his beer from malt and hops and pure glucose, sent me a sample, and I found it contained a good deal of arsenic.

ADULTERATION OF FOOD AND DRINK IN MANCHESTER.

REPORT OF THE CITY ANALYST.

A REPORT of the Manchester public analyst, Mr. C. Estcourt, for the last quarter in the year 1900, upon the articles analysed by him under the Sale of Food and Drugs Acts and the Margarine Act was presented to the City Council last week. Mr. Estcourt makes the following observations on his work:—It will be observed that the percentage of adulteration of spirits is very high, and strangely uniform. This I ascertained in two cases was due to a defective instrument used by the publican in breaking up his spirits. The percentage of samples adulterated of milk is very low, and I am pleased to be able to state that no cases of fat abstraction were found this quarter. The adulteration of golden syrup by the addition of a large quantity of starch glucose appears to have ceased entirely. With respect to tea the public still suffer, from the fact that there is no standard laid down for mineral matter. Until this is done the addition of sand and other mineral matter cannot be certified as adulteration, as this extraneous matter is supposed to have got in during the process of collection or manipulation. The same remarks apply to ginger and many other natural products. Apart from the samples of beer contaminated with arsenic, the percentage of adulterated samples continues very low, being equal to only 3·4 per cent.

With regard to those beers contaminated with arsenic which contain one-tenth of a grain of arsenious acid per gallon and upwards, there can be no doubt from the investigations carried out that this quantity is largely due to the impure glucose used in the manufacture of beer. Although only one firm of glucose manufacturers has been publicly incriminated so far, it should not be forgotten that I have informed the health department of the Corporation that at least two other manufacturers have delivered glucose to brewers in Lancashire which contained arsenic in considerable quantity. It thus becomes imperative on brewers to examine every sample of glucose which is delivered into their breweries. Regarding the smaller quantities of arsenic found in beer—namely, from one-tenth to one-two-hundredth of a grain of arsenious acid per gallon—I am of opinion that this is probably due to the malt used. I have found malt on the market and in use by brewers which, if used in brewing without any glucose, would pollute the beer to the extent of one-tenth of a grain of arsenious acid per gallon. This information I have also conveyed to the health department. Nothing but a new method of drying malt, which will prevent the fumes of the fuel from coming in contact with the malt, will do away with the certainty of pollution with arsenical fumes. It will be seen that until a change is made in this respect a beer brewed from malt and hops alone will not necessarily be pure. Total number of samples analysed during the quarter, 432; number of samples adulterated, 52.

CHEESE AS A FOOD.

CHEESE is a very rich and valuable food likely to form a very large constituent in the future, and especially for the working man, to be very extensively used. There is a difference in stomachs in their ability to digest this article. The writer is able to make an entire meal of cheese with very little bread, and digest it more easily than rice or oatmeal; but in most stomachs it is less digestible, in some extremely so. Each person must learn for himself. It is a convenient form of animal food, and, when good, particularly agreeable. The varieties of cheese are numerous. Some imported cheeses, like two or three varieties from Germany, are abominable in smell and most unwholesome. Cheese was known to the ancients. Homer, Aristotle, and others mentioned it. It is mentioned in the Bible. There is a great difference in the composition of cheese, both in its water, fat, and nitrogenous matter. In general, however, it might be remarked that every variety contains a large amount of nitrogenous matter, and it is for this that it is especially useful as a food. Skim-milk cheese is especially rich in this constituent, but less rich in fat. Those who abstain from flesh food will find in cheese abundance of nitrogenous matter to take the place of that found in flesh.

ADULTERATION OF COFFEE.

COFFEE offers a ready field to the skilled manipulator, who uses for his materials almost anything he can roast and grind, as peas, pea hulls, chicory, pilot bread, red slate, &c. A common adulterant is a mash of ground, roasted wheat or peas, moulded together with molasses and coloured with red ochre. In some cases it takes the form of a very clever counterfeit in point of appearance of the whole coffee beans. They contain no coffee whatever, and consist almost wholly of roasted wheat. They are moulded so neatly as to hardly be distinguishable in outward appearance from the genuine. Coffee substitutes are, as is well known, very common. Most of these contain cereals only, but one very well advertised brand, purporting to contain nothing but the entire wheat kernel roasted and ground, has also peas and about 30 per cent. of that "most noxious drug," coffee itself.

CASES IN COURT.

[RECORDS of Police-court proceedings for insertion in the "Food and Health" Supplement should reach us not later than the 10th of the month. Generally speaking, they should be as brief as possible, but where any important point of law is involved a fairly full report is permissible.—ED. S. R.]

Adulterated Coffee.

AT Hadleigh Petty Sessions, before Messrs. H. Newman (chairman), T. N. Scarfe, and G. T. Harrison, Alfred Christie, grocer, was summoned by Superintendent Peake, under the Food and Drugs Act, 1875, charged with selling as pure coffee a mixture of coffee and chicory.

Mr. C. E. SALMON prosecuted.

Defendant was fined £1 and £1 17s. costs, and paid the money.

Raid on Margarine Sellers.

TWENTY summonses under the Margarine Act were heard at Southwark Police-court against ten defendants for selling as butter mixtures of butter and margarine, and for neglecting to wrap the articles in papers labelled "Margarine."

All but one of the defendants were convicted, and penalties ranged from £20 and costs to £5 and costs.

Unsound Meat at Glasgow.

A CATTLE-DEALER named John Gilmour, 43, Fullarton-street, Kilmarnock, was fined £5 by Bailie Robertson at the Glasgow Central Police-court for having exposed for sale in the cattle market a cow which was diseased and unsound.

The case was a very lengthy one, lasting for several hours.

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THE CHEMISTRY OF COOKING.

No woman can be said to be thoroughly proficient as a professor of housewifery until she understands something of the chemical elements of food, and the purpose they serve when taken into the system. The use of chemistry in cooking is to teach how to supplement one kind of food for another which contains certain essential elements lacking in the first. The human body has been likened to a machine, and like any other machine, it is constantly wearing out. Every movement and every breath is breaking down cells and tissues, and this waste must be repaired to keep the body in normal working condition. Food taken into the system has two offices to perform, the repairing of bodily waste and the supplying of fuel to keep the bodily heat up to 98 degrees. Foods may be divided into three classes, nitrogenous, carbonaceous, and those in which both are united. Nitrogenous food repairs bodily waste and builds up muscle and tissue, and carbonaceous food supplies fat, heat and energy to the body.

Of late, too, especial attention has been given to brain and nerve food, and it has come to be understood that if we would send forth from our homes into the world healthy, brainy men and women, well equipped physically and mentally for the battle of life, we must see to it that nerve and brain, bone and muscle, flesh and blood are all fed and nourished and built up, each with its own element of food. And thus the necessity of a balanced ration for the family is plainly seen. When a knowledge of the needs of the body is supplemented by intelligent cooking, a wholesome, strengthening and nourishing meal is the result. Cooking, too, loses its old sense of common drudgery when considered as a scientific process, and a cook who understands food values and the chemistry of every-day cookery has a perfect right to consider herself a scientist.

Of nitrogenous foods the richest is found in the albumen of eggs, lean meat, the curd of milk, peas, beans, oats, and whole wheat flour, and many vegetables of which cabbage and onions rank first. Carbonaceous foods are in two classes, the fats and the carbohydrates, both containing the hydrogen and oxygen. The fats include the fat of meat, cream, butter, vegetable oils and grains. Carbohydrates include starch and sugar, sugar being cane sugar, honey and the sugar of fruits. The starches include the starchy vegetables, as potatoes, and cereals, as rice, corn, wheat and oats. Milk is an almost perfect food. It strengthens the whole body. The cream gives us fat; the whey contains the salts and phosphates that strengthen the brain, bones and digestive organs, and the curd is the muscle-making, energy-producing substance. Eggs are rich in nitrogen and also sulphur for the brain and nerves. But as a brain food, fruit heads the list, containing as it does the salts and acids which are exceedingly wholesome, and which aid so materially in the digestion and assimilation of other foods, fish, eggs, oysters, lobsters, game and cheese.

From this it will be seen that the food that would best sustain and nourish a labourer in the open air would not be the best diet for a brain worker. A dinner of boiled salt pork and cabbage and whole wheat bread is nearly perfect for an outdoor labourer, as the cabbage is rich in nitrogen and the pork in carbon. Beans next to meat contain the most nitrogen, and are excellent food for labourers, and next comes oats, wheat and barley. In cold weather the system requires more carbonaceous food, and in summer fruit, creams and vegetable salads should appear on the bill of fare. And from this it will be seen that a knowledge of food elements and the needs of the human body is quite necessary in order to provide the different members of the family with a balanced ration of food best suited to their needs.

Every housewife should supplement her collection of cook books with a good work on the chemistry of food, and should make its contents a special study. Scientific stockmen have come to consider the balanced ration a necessity for the best development of animal life, and how much more so must it be for the best mental and physical developement of human beings.

THE FEEDING OF INFANTS.

The death-rate of infants from diseases incident to the alimentary canal is truly appalling, and since this condition depends largely upon dietary we conceive at a glance the prominence of the subject. If we in every instance could furnish the ideal food, we would meet the panacea to the prevention of these dread diseases. Observation, as well as experience, has proven that the welfare, the health, and the growth of the infant depend not so much on medicine as proper care and feeding. We believe that if a strict and proper diet sustained in every instance, infantile mortality would be reduced 90 per cent. If these opinions are true, our profession is alarmingly ignorant or negligent of its duty in the premises. We concede, however, that in many cases the physician is not responsible for these results. Often, and most often as for that, he has no knowledge of the condition of the infant or its mode of life until it is in the clutches of some dread disease. Then, when sent for, he must play the *rôle* of an instructor, a lecturer, and proceed to enlighten the mother, the aunt, the grandmother, of the little unfortunate—a most difficult task.

Concerning the infant's nourishment, let our ideal be nature's ideal—the *mother's milk*, and this our guide around which all other foods revolve in seeking perfection; remembering, however, that mother's milk is the ideal to the extent that we are furnished the healthy milk from healthy mothers.

Many mothers are not healthy, and even if they are they often give poor milk. These are points of interest, and require careful study, since the health, and welfare, and even the very existence of the little one depend upon them.

To improve conditions of mother and quality of her milk we look to tonics and regulation of her life and habits. If she be constipated, anæmic, or nervous, these impressions are transmitted to the infant, and he suffers the consequences. If constipation the fault, relieve by exercise, habit, and proper medicine; if nervous exhaustion, rely on nerve tonics and rest; if anæmia is of the kind that can be relieved do so; if permanent and of a serious constitutional character, withdraw the infant at once from the breast and depend entirely upon the "bottle."

With reference to the quality of milk the question naturally arises at this stage, What are the constituents and their proportions of good healthy mother's milk, and what the amount of such food required by the average infant that he may thrive best? Proper and careful analyses have shown that infants to do best should receive milk which contains fats, proteids, sugar, and salts in following proportions, respectively: 4, 1½, 7, and 2 per cent. These investigations may be sufficiently accurate to be remembered, and any great variation therefrom may be viewed with suspicion. While the quality remains practically constant, the quantity varies with age of infant. The average healthy child receives during the second and third week of life approximately twenty ounces of milk per diem; at twelve to sixteen weeks, one quart; and a continued increase with the age until at one year he consumes between forty and fifty ounces of milk every twenty-four hours. Regularity of

feeding, length of time at the breast, and amount fed at each nursing, are considerations well worth remembering.

The nursing children are not the ones however, about whom we are mostly concerned; if so, the solution of this problem would be comparatively nil. His more unfortunate brother—the one for whom nature has failed to provide—is he who demands our attention and profound consideration. This age of inherited weakness, depraved nature, and growing pathogenic tendencies, calls for wakefulness, watchfulness, and alertness on our part.

No branch or subdivision of medicine gives us more concern than artificial feeding. And here we might give our opinion concerning the employment of wet nurses. I have my serious doubts as to the propriety of ever relying upon this means of feeding. When we remember the class of individuals from whom we are to select, and when we remember how readily constitutional diseases are transmitted through the breast, and when our attention is further called to the fact that the expense of employing a wet nurse reaches far beyond the financial strength of most people, we think it wise to abandon this method altogether, and rely upon our skill to prepare properly other foods.

The best, and without doubt the most convenient, of the artificial foods is the cow's milk. It contains essentially the same ingredients as the mother's, but in different strength. To convert this into acceptable nourishment much preparation is required. We must select the healthiest cows fed on the best and purest food. Use rather the milk of a herd than that of a single animal. Other considerations are the age of the food, its cleanliness, and its strength. These are of paramount importance, since bacteria increases with age of milk, and since these pathological conditions depend directly upon these poisonous germs.

This matter is of more import in cities than in small villages and in rural districts. The milk here is often forty-eight to sixty-four hours old before being used. What, then, is the best method of preparing this milk for long-continued use?

After the age of eight, ten, or twelve hours, it will not bear being fed plain. It is claimed that heating milk to the point of 167 deg. Fah., known as pasteurisation, sufficiently sterilises it to destroy typhoid, diphtheria, tubercular and scarlet-fever germs, and at the same time does not alter the taste or the digestible quality of the food. If these investigations are true, and we accept them as such, this is better than subjecting it to a higher temperature. This we believe to be the best means of preserving milk for short periods of time. While for travelling long distances, sea voyages, &c., in way of convenience, condensed milk is best. The preparations of this we are all more or less familiar with. It consists of heating fresh cow's milk to a temperature of 212 deg. Fah., for a stated time, then evaporating *in vacuo* at a low temperature and adding cane sugar. This is conveniently kept in tin cans. When fed we add ten or twelve parts of sterilised water to one part of milk. This reduces the percentage of casein until it is easily assimilated by the most delicate stomach.

In studying the subject of cow's milk for infant feeding, we should examine it from every point of view, even to the selection of the dairyman and his herd. Call this party's attention to his responsibility in the premises. The more nearly immaculate he can present himself, his herd and their compartments, the more fortunate for all concerned. The physician can do much to encourage him in this respect. If practicable, organise a board of health. Have the milk examined as to cleanliness, strength, and age, and refuse to tender your approval or endorsement until these requirements have been scrupulously complied with.

WINE ADULTERATION IN PARIS.

An extraordinary story of wholesale adulteration of wine in Paris is told by a contemporary. The beverage in question, which has, it appears, been selling like wildfire for the past few years at a low price, is described as "natural wine" and "vin des vendages." That it hardly deserves these attractive appellations has been shown by the analyses of some 2000 specimens made at the Municipal Laboratory of Chemistry. Not a single pint of the so-called wine was found to be unadulterated. The foundation of the beverage consists of "vin piqué" or "vin de pressurage," officially stated to be unfit for consumption. This was mixed with some real and rather strong wine, which provided the flavour. To the concoction was then added 40 or 50 per cent. of water. But the "wine" required still further manipulation before it could be retailed to unsuspecting consumers. A harsh acid taste, which remained from the original "vin piqué," had to be counteracted chemically, and this was achieved by the addition of potash, chalk, and baryta, among other substances. Even this, however, was not the final stage in the adulteration. Owing to the considerable proportion of water the beverage still required "strengthening." With this end in view various chemical substances were further added, such as tannin, tartaric acid, citric acid, and in some instances phosphoric and even sulphurous acid. The concluding statement of the Municipal Laboratory report, that the mixture in question "constitutes a beverage injurious to the health," is certainly incontrovertible. It is said that the manufacturer of this fearful concoction has made some £10,000 a year profits out of his "wine" selling business.

DANGER IN CHEESE.

A good deal is written upon the sterilisation of milk, but are butter and cheese innocuous? It would appear that the latter is, at all events, not wholly free from dangerous properties, as a serious case of cheese poisoning recently occurred in America.

A portion of the cheese which gave rise to the poisoning was sent for examination to the State Laboratory of Hygiene at Ann Arbor. The bacteriological examination revealed the presence of the colon bacillus in the virulent form.

The colon bacillus is a germ which is always present in the alimentary canal of warm-blooded animals. It is present in great numbers in the excreta of cows, horses, and other domestic animals. These germs are always found in milk because of the contamination of the milk by barnyard and stable filth, which is rarely separable from the conditions in which milk is ordinarily produced.

The fact that this bacillus is present in cheese is an important one that ought to be brought to the notice of the public everywhere. It is also important to know that this germ is capable of giving rise to symptoms closely resembling typhoid fever. Cholera morbus is, perhaps, chiefly due to the action of this germ in a virulent form. It may also cause peritonitis, abscess of the liver, pneumonia, and a variety of other grave infections. The tubercle bacillus has also been found in cheese several weeks old.

Those who insist upon eating cheese should take the precaution to cook it thoroughly before eating. It is for this reason that some people who are unable to eat raw cheese find themselves able to eat toasted cheese without difficulty. Toasting the cheese does not, however, increase its digestibility, but rather the reverse. Its beneficial effect, if any, is from the

destruction of the virulent microbes which are present, and which are capable of giving rise to symptoms even more distressing than those of ordinary indigestion. The best method of dealing with cheese is to give it to the pigs, as it is nothing more or less than decayed milk, and is fit only for a scavenger diet.

REGULATIONS FOR MILK AND CREAM.

The Departmental Committee appointed by the Board of Agriculture to inquire into, and to report upon, the desirability of making regulations with regard to the sale of milk and cream have just published a very interesting document containing their recommendations. Despite the opinion expressed by many that the problem of controlling the milk trade was one which well-nigh defied perfect solution, yet the overwhelming body of evidence, says the *Lancet*, is in favour of the view that the setting up of some statutory limits for milk is necessary. Unless it be held that the Food and Drugs Acts are as regards the sale of milk unnecessary—a view actually taken by not a few—it is difficult to escape from the conclusion that some limits should be fixed in order to make analysis a criterion as to the quality of the milk. It has been proposed that seasonal limits might be adopted in order that no injustice should be done, for it is true that the quality of normal milk varies at different seasons of the year. The adoption, however, of a set of minimal limits which should be applicable at all times and under all conditions to milk produced for consumption, is the course which has commended itself to the committee. Ultimately, after a careful survey of the evidence, the committee are disposed to conclude that the milk produced for sale in this country contains on an average from 12·5 to 12·8 per cent. of solids, comprising from 3·7 to 4 per cent. of fat. Any milk, therefore, the committee consider, in which the total solids are less than 12 per cent. should be further inquired into, and if it should be then found that the amount of butter-fat is less than 3·25 per cent. a presumption would be raised that it had been mixed with separated milk or water, or that some of its original fat had been abstracted; if the solids, not fat, are found to be lower than 8·5 per cent., a presumption that it had been mixed with water would arise.

In regard to cream the committee are of opinion that the weight of evidence was not favourable to the establishment of official limits of fat; nor does it appear that any substantial difficulty arises in selling cream in different qualities, at corresponding prices to meet the requirements of the public. It is very properly considered, however, that steps should be taken to prevent the artificial thickening of cream by the addition of gelatine or other substances. The recommendations of the committee also relate to the composition of separated milk and condensed milk, in regard to the quality of which similar recommendations as to limits are laid down. The report is signed by all the members of the committee except one, who, being unable to give his assent to the principal recommendations, embodies his own conclusions in a separate report. Mr. Barham in this report is in favour of the adoption of a seasonal standard. He takes 3 per cent. of fat as fairly representing, with 11·75 per cent. total solids, the milk during the months from July to February inclusive and the same amount of total solids with 2·75 per cent. of fat for the months from March to June inclusive. In any case he regards the milk as deficient in its normal constituents when the total solids are less than 11·75 per cent. and the non-fatty solids than 8·5 per cent. Mr. Farmer signs the report subject to a reservation. He also agrees to seasonal limits and objects to the suggested limit of 3·25 per cent. of fat for the whole year. We feel sure that it will be ultimately shown that legislation can only be satisfactorily applied towards upholding the supply of milk of good quality by the adoption of one limit for all seasons of the year. Moreover, since it was announced some months ago that the limit adopted at the Government laboratory was 3 per cent. of fat, the quality of the London milk supply has very materially improved, as shown by the latest analytical returns.

ALCOHOLISM AS A FACTOR IN INSANITY.

In a journal devoted to questions of health, it is impossible to overlook the health of the mind as well as of the body, for the two are intimately related. Indeed, the best opinion now holds mental disease to be simply bodily disease, resulting as directly from physical disorders of the brain as diseases of the body do from disorders of the various organs affected. And it is distressing to know that this class of disease has been very much on the increase in recent years. Dr. Clouston, physician to the Royal Edinburgh Asylum for the Insane, in his annual report brings out several features in connection with this subject with most painful emphasis. The past year has been a record one for admissions, the number being 38 over the average of the past five years. Among the causes to which this increase is to be attributed he has no hesitation in ascribing the first place to alcoholism, which, in its turn, is due to the exceptional prosperity of the country, with brisk trade and high wages during the last few years. Last year 115 cases, or about a fourth of the whole admissions to the Edinburgh Asylum, were alcoholic cases. Dr. Clouston points out that his alcoholic lunatics rose from an average of 15½ per cent. in the years 1874-1888, to 21½ per cent. in 1889-1898, to 22½ per cent. in 1899,

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COUPONS AND PARTICULARS WITH EVERY BOTTLE.

and to 24½ per cent. in 1900. He would also add 49 general paralytics to the list as due to the same cause. There had never been so much general paralysis before, and he put a large part of it down to a bad use of prosperity. This increase in alcoholic insanity occurs chiefly in the large towns, but it is noteworthy that the largest increase in general insanity does not come from city populations, as might have been expected with their artificial modes of life away from nature, their stress of circumstances, and their drinking. On the contrary, to use Dr. Clouston's graphic words, "The greatest increase by far had really taken place in the northern and highland counties, where mankind still lived in the quiet of green fields, or in sight of the smiling ocean. The increase in those rural and seashore counties had been 80 per cent., while the rest of Scotland had only gone up 42 per cent." In Edinburgh itself there has even been a decrease in proportion to the population. From these Blue-book figures Dr. Clouston draws two contrasting pictures. On the one hand, we have the Highland crofting families, where most of the young and energetic members had gone south to push their way in the world, leaving behind only the old and less energetic minded, with no mental vigour to stay the onset of disease; and on the other, the vigorous city worker, making more money in good times than his educations and social requirements could utilise for his legitmate enjoyments, tempted by the dangerous mental ideals which alcohol could create for him, and so undermining his physical and mental constitution.

FOOD AND DRUG INSPECTION IN MASSACHUSETTS.

Some interesting details on Food and Drug Inspection are embodied in the 31st annual report of the Massachusetts State Board of Health. From this it appears that cheese is subject less to adulteration in Massachusetts than any other of the principal articles of food. Of thirty-four examples examined, no evidence of adulteration was found; but the real reason for this is the lack of a legal standard of quality. Several samples of skimmed milk cheese were found. Massachusetts has no law fixing the standard of fat in cheese, and in the absence of such a law skimmed milk cheese can be sold with impunity. Five of the Western States have laws fixing the standard of fat from 20 to 35 per cent. Tabulated statistics show that the laws of 1883 to prevent adulteration have brought about a marked improvement. This is especially true of butter, condensed milk, condiments, coffee, molasses, maple syrups and maple sugar, honey, confectionery, and canned goods. The percentage of adulteration in these articles is much lower than a few years ago; but in wheat flour, spirits, wine, beer, and cider, drugs, jellies, and jams, a good deal of adulteration exists.

While adulterated coffee is one of the most common forms of falsification found in the markets, adulterated tea is comparatively rare. At the beginning of operations under the Food Acts in 1883 the markets were still flooded with the cheap imitations of coffee which became so common soon after the civil war. They were mostly put up in packages containing one pound in each package, the mixture containing variable percentages of chicory, roasted peas, beans, wheat, rye and other cereals. They were usually sold at a much lower price than pure coffee. There is now a considerable demand for coffee substitutes, and many brands of roasted cereals find a ready sale and are mostly labelled honestly. At the present time the adulterations of coffee are chiefly those which consist of a mixture, the chief ingredients of which are usually pure coffee in the proportion of sixty to eighty per cent., the remainder consisting either of chicory or cereals or both, the whole being sold either in bulk or in packages of two to five pounds or more. These are usually labelled as blended or mixed coffee, or often as pure coffee, but quite as often they bear a misleading label, which, after considerable study, appears to indicate a mixture.

The general result of analyses of coffee shows a reduction from 33 to 18·7 per cent. of foreign substance. Several years ago an artificial coffee berry was invented, having a very close resemblance to the genuine roasted berry. It was undoubtedly believed by the manufacturers that this imitation could be used successfully by mixing it with roasted, unground coffee berries in certain proportions. The false berries, however, being made of roasted starch or of similar material, lacked the most important characteristic of genuine coffee, the taste or flavour. Hence as an adulteration they proved a failure, especially in States where food inspection is practised.

The examination of teas shows a remarkable freedom from adulteration, the whole number of samples collected being 976, with only 31 adulterated samples. The ratio of adulteration in the later period was greater than that of the first, but this fact has little significance, since the absolute numbers in each case were quite small.

Within the past few years adulteration has found in jellies and jams a fruitful field of operation. Not many years ago the principal constituents of such articles were chiefly fruit, sugar, and water; but the tendency to cheapen the product has led to the introduction of glucose instead of cane sugar, of cheaper instead of the more expensive fruits, and of aniline dyes to imitate the colour of genuine fruits.

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"is of more importance still, these are presented
"in a condition more easy of assimilation and digestion
"than in Cocoa not so prepared."

HOW MILK SPREADS DISEASE.

An outbreak of scarlet fever resulting from milk supplies is referred to in the annual report of Dr. Thurwell, Medical Officer of Health for the borough of Gravesend. He says:—"On February 26th and up to March 1st, a sharp exacerbation took place, in which almost all the houses infected were supplied by one dairy; this is outside our district—in the Strood rural. On February 28th I visited the dairy in company with the Sanitary Inspector and the Veterinary Surgeon, and took two samples of milk for bacteriological analysis, and the report of these from University College was submitted to the Committee and to the Local Government Board. One of the cows was considered doubtful as to some pimples on the udders, but was afterwards declared to be satisfactory. The place was well kept, and clean, provided with ample cleansing arrangements. It was said that no one at the dairy had been ill with anything like scarlatina. On March 1st I received information that one of the men who delivered milk had been ill and away from work for four days. I went to the dairy and examined him, and found him desquamating freely on the neck, arms, hands, and feet; some of the skin affected was quite characteristic. He was at once suspended from work and sent to his room, and later removed to the sanatorium. The cow stalls were disinfected; the cows' udders were cleansed with disinfectant, and later it was considered advisable to have the whole place limewashed. Eighty-six cases were reported about this time in three weeks. It was quite apparent that where this milk carrier had been on his round was worse affected. Up to the end of June we had a good many cases, but after that time there was a general subsidence. There have been 208 notifications during the year, and 118 of these were between five and fifteen, 40 were between one and five, 39 between fifteen and twenty-five, 9 were over twenty-five, and 2 under one year. The inspection, cleansing, and isolation, and later the disinfection, has entailed a vast amount of work. The epidemic has been of a very mild character—only two deaths have taken place. Owing a great deal to the mildness of the disease some cases have not been recognised before desquamation. A woman was convicted before the magistrates for continuing to go about the town as usual, although she was aware that she was suffering from scarlatina; she had taken no precaution whatever against spreading the disease. With the means now at our disposal it is not probable that we shall have to deal with so many cases in the future."

ARSENIC IN FOOD AND DRINK.

"Owing to the prevalence of arsenical poisoning in certain parts of the country," says Dr. Alfred Hill, Medical Officer of Health and Analyst to the city of Birmingham, "I tested thirty-two samples of ale and beer, and twelve samples of brewing materials for the presence of arsenic. In one of the samples of beer a very slight trace was discovered—about one-hundredth part of a grain per gallon—while in two samples of glucose a larger quantity was present. The firms from which these three samples were obtained immediately recalled all the beer which was likely to be contaminated, and ceased using the impure glucose. Eighteen samples of golden syrup and table syrup, seventeen of jam and marmalade, and eight of sugar confectionery, were also examined, but presented no signs of the pre-

sence of arsenic. From inquiries made at the General Hospital, Workhouse Infirmary, and Skin and Urinary Hospital, I learn that the cases of alcoholic neuritis treated at these institutions in the last six months of the year were fewer than those which occurred in the first six months. I find also that the deaths recorded in the city from the same complaints were rather fewer in the second half of the year than they had been in the first half, numbering five against seven. It appears probable, therefore, that the cases of neuritis were not the result of arsenical poisoning, but of other causes, and that Birmingham has, fortunately, suffered but little, if at all, from the presence of arsenic in beer or other articles of diet."

THE INSPECTION AND DISPOSAL OF TUBERCULOUS MEAT.

ACCORDING to the *Aberdeen Journal*, the butchers of that city complain that the application of the law in regard to the destruction of condemned meat is more rigorous than in other towns. Inquiries have, however, elicited the fact that such is not the case. It may be mentioned that the practice in Aberdeen is based on the following recommendation contained in a circular issued by the Local Government Board in October, 1899 :—

Principles to be Observed by Meat Inspectors in the Inspection of Tuberculous Carcases of Cattle.

We are of opinion that the following principles should be observed in the inspection of tuberculous carcases of cattle :—

The Entire Carcase and all the Organs may be Seized :—

(*a*) When there is miliary tuberculosis of both lungs.

(*b*) When tuberculous lesions are present on the pleura and peritoneum.

(*c*) When tuberculous lesions are present in the muscular system, or in the lymphatic glands, embedded in or between the muscles.

(*d*) When tuberculous lesions exist in any part of an emaciated carcase.

The Carcase, if otherwise Healthy, shall not be Condemned, but every Part of it containing Tuberculous Lesions shall be Seized :—

(*a*) When the lesions are confined to the lungs and the thoracic lymphatic glands.

(*b*) When the lesions are confined to the liver.

(*c*) When the lesions are confined to the pharyngeal lymphatic glands.

(*d*) When the lesions are confined to any combination of the foregoing, but are collectively small in extent.

In respect of foreign dead meat, seizure shall ensue in every case where the pleura have been "stripped."

Mr. Kenneth Cameron, Chief Sanitary Inspector for the city, points out that the inspection in Aberdeen is carried out strictly in accordance with the above rules, which, though permissive in their operation, are nevertheless the authorised views of the chief administrative body in the country, and founded on the report of the Royal Commission on Tuberculosis. He states that if other Authorities or officials fail to carry out these rules, that cannot alter what he believes to be right and what he feels to be necessary in order to protect the public and give effect to the law. If the law is less rigorously enforced elsewhere, the inference is that the Authorities in these places are not fully carrying out their duty. He asserts there is not a single case where the action in Aberdeen has been in excess of the above regulations, and these he regards as the minimum required to protect the public health. Whole carcases are not confiscated unless they come under the first category.

There were 300 separate seizures last year, but it would be a mistake to suppose that they were all made by the sanitary officials pouncing in upon dishonest traders and seizing carcases sought to be surreptitiously disposed of as human food. In many cases notice is given to the sanitary officials by the owners that meat appears to be unsound, and the officials are asked to come and see the suspected lots, with the result that they are generally condemned. It is often the butcher or cattle dealer who is most surprised when a slaughtered animal shows signs of tuberculosis, and in the case of the more responsible members of the trade the discovery is notified to the Authorities. Of the 300 seizures last year the unsound lots in 296 cases were destroyed, "with the consent of the owner." In only four cases was a magistrate's warrant required to secure the destruction of the material seized.

CASES IN COURT.

Adulteration and Obstruction.

AT the Manchester County Police-court, before Mr. J. M. YATES, K.C. (stipendiary), and other magistrates, John Nevin was summoned under the Food and Drugs Act on three charges—for adulterating coffee, refusing to sell coffee, and obstructing Inspector Parker whilst in the execution of his duty.

On the 21st of January the Inspector visited defendant's shop in Swinton Hall-road, and asked for four ounces of coffee. Defendant refused to sell, but afterwards he said he would sell him only one ounce. The Inspector put his bag on the counter, and was going to divide the article when the defendant took it off and put it on the floor. It was afterwards analysed and found to contain 40 per cent. of chicory.

Defendant was fined 5s. and costs in the first case, and he was ordered to pay the costs in the other two cases.

Foreign Fats in Butter.

AT the same court, Patrick Kelly, of 47, Cross-street, Gorton, was fined 20s. and costs for selling butter containing 80 per cent. of foreign fats and 12 per cent. of water.

A fine of 40s. and costs was imposed on Joseph A. Railston, 202, Moss-lane East, Moss Side, for selling margarine for butter. When the Inspector visited the defendant's shop he asked the price of the butter, and was told 1s. 3d. and 1s. a lb. He then asked for 1 lb., and paid 1s. for it, and inquired what kind it was, and defendant's son replied, "Irish." The defendant afterwards came in the shop himself, and said it was margarine, but the transaction had been completed. Defendant was fined 40s. and costs.

Glucose in Jam.

A PROSECUTION for the sale of marmalade adulterated with glucose took place at Worthing, and a fine of £1 and costs was imposed upon a retail grocer named Smith.

Mr. de FONBLANQUE, solicitor, of London, appeared for Messrs. Crosse and Blackwell, the manufacturers, who accepted the entire responsibility. They distinctly pleaded not guilty, as they claimed they were perfectly entitled to do what they had done. He differed from the ruling given by the Bench a week ago, submitting that jam (and in the word he included marmalade) was fruit cooked in a medium which had the quality of preserving it, provided that the medium was wholesome. There was nothing to prevent the manufacturer from seeking to meet the tastes of his customers. It was intimated that the appeal would be taken upon this rather than upon the preceding cases.

Food & Health

No. 51. APRIL, 1901.

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MILK AND MEAT FROM TUBERCULOUS ANIMALS.

INFECTION THROUGH THE DIGESTIVE TRACT.

The danger from the use of milk and meat from tuberculous animals is sufficient to justify the enactment of efficient laws to protect the public against the danger, and the careful execution of such laws; nevertheless, those persons who assume that the use of tuberculous food products is the prime factor in the causation of human tuberculosis are deeply in error. In the State of Maine, in the seven years 1892-98, only 266 deaths were recorded as due to abdominal or mesenteric tuberculosis, while from tuberculosis of the lungs 8429 persons died.

It is not here contended that every fatal tubercular infection which has its starting point in the intestinal tract presents a symptom-complex which eventuates in a death returned as from abdominal tuberculosis. Dr. Woodhead * says:—"I have seen in case after case in children, and in animals fed on tuberculous material, the lungs markedly affected, but in a large proportion of these cases it has been possible to trace the course of invasion back from a caseous or old calcareous mesenteric gland through the chain of retro-peritoneal glands up, through the diaphragm to the posterior mediastinal and bronchial glands, and so on to the lung. I have not seen this in a few cases only, but in dozens of children, in a few adults, and in many animals."

Tuberculosis of the intestinal tract and of the mesenteric glands is much more frequent among children than among adults, but even among children, these forms of tuberculosis, due principally to the use of milk from a tuberculous source, are much less prevalent than is primary tuberculosis of the bronchial glands and of the lungs. Biedert, quoting the results of the post-mortem examination of the bodies of 1346 cases of tuberculosis states that, in 79·6 per cent. of them there was a localisation of the disease in the lungs; in 78 per cent., in the bronchial glands; in 31·6 per cent., in the intestines; in 40 per cent., in the mesenteric glands.

In a paper by Dr. L. E. Holt, of New York, giving the results of the autopsies on 119 tuberculous children, tuberculous lesions were found in the lungs in 99 per cent., in the bronchial lymph nodes in 96 per cent., in the intestines in 37 per cent., and in the mesenteric lymph nodes in 35 per cent. of the subjects. He says:—"The source of primary infection of the alimentary tract may be either the milk of a tuberculous nurse or tuberculous cow, or tuberculous meat. All of these I believe to be extremely rare. Their importance in the etiology of tuberculosis in infancy I think has been very greatly exaggerated. In the series of autopsies above given there was not one in which a careful study of the lesions made it at all probable that the primary lesions were of the stomach or intestines, and in 63 per cent. of these cases the intestines were not affected at all. In the cases where the stomach and intestines were the seat of tuberculosis, with very few exceptions the disease has been only slightly marked in that locality, while very advanced in the lungs and bronchial lymph-nodes. The great infrequency of primary infection through the alimentary tract is also shown by the experience of Northrup, who, in a series of 125 autopsies upon tuberculous children, mainly infants, found but a single case in which the infection appeared to have occurred in this manner, as against 88 in which it was clearly through the bronchial lymph-nodes.

"That bacilli may pass the mucous membrane of the intestine without producing disease in it, is not impossible. I have been looking for years for a case where the mesenteric glands were manifestly tuberculous, without tuberculous ulceration of the intestine, and I have yet to find the first one. Considering how extremely susceptible are the intestines of infants to other forms of infection, this contrast is rather surprising. The explanation of the difference seems to me to be this: Intestinal infection is nearly always secondary to disease of the lungs. Infants usually died from the more rapid tuberculous processes in the lungs or brain before there has been time or opportunity for intestinal infection to occur. The opportunities for such infection depend upon the number of bacilli which are coughed into the pharynx and swallowed. In infancy this number is small, because so many die of tuberculous pneumonia or meningitis before extensive softening in the lungs has taken place. In older children the slower course of the pulmonary disease gives ample time for intestinal infection, while the more extensive softening and excavation are accompanied by discharge of a much larger number of bacilli. I believe most strongly that all cows whose milk is used for food, whether for infants or older children, should pass the tuberculin test; and, further, that when the milk supply is from a doubtful source, milk should be heated to a sufficient degree—167 deg. Fah.—to destroy such bacilli, should they be present. Vastly more important is the enforcing of stringent rules regarding the isolation of persons with active tuberculosis, both in the home and the hospital, the careful destruction of the bacilli in the sputum from such cases, the disinfection of apartments after attacks, and most of all the early diagnosis of the disease in all persons who are brought into close contact with children, whether as nurses, teachers, or companions."

THE MILK FROM TUBERCULOUS COWS.

The matter under the preceding sub-heading is presented for the purpose of correcting the erroneous impression which is somewhat current, that the use of tuberculous milk and meat exerts a preponderating influence in the causation of tuberculosis. But, on the other hand, the object of that which is here presented is the correction of the opposite extreme opinion that there is practically no danger of infection from tuberculous milk, and that there is no evidence indicating that human beings have suffered infection from the use of such milk.

In a family of nine or ten children in Norway, Europe, two of the younger ones, aged one and three years respectively, died of tuberculosis, the younger one first showing mesenteric disease, and died of tubercular meningitis, the other, sixteen years of age, died of phthisis. There was no other history of tuberculosis in the family. The one cow which supplied the whole family with milk was slaughtered, and found to have tuberculosis of all the organs, the udder included.

Gosse, of Geneva, lost a daughter from intestinal and mesenteric tuberculosis. There was no family history of tuberculosis. Suspicion fell upon some of the cows whose milk the girl used to drink fresh from the udder. Four out of the five cows on the estate reacted to tuberculin, and were slaughtered. Two of them showed tubercular disease of the udder.

Professor Ropp, of the Iowa State College, cites the following case of transmission of tuberculosis by the use of the milk from tuberculous cows:—"Olivier reports that in a young ladies' boarding school five girls, the children of healthy parents, died of tuberculosis of the intestines. The cow which had for years supplied the school with milk was found to have generalised tuberculosis, including the udder. Two daughters of a Scotch family of good health who were brought up on milk of tuberculous cows died of tuberculosis. Two sons in the same family who did not use the milk remained healthy. Stang reports the case of a five-years-old boy of sound parentage and ancestry who died of tuberculosis. The cow whose milk this boy used was found badly tuberculous. Demme reports the

* The *Lancet*, II., 1894, 960.

cases of four infants in the Children's Hospital at Berne, the offspring of sound parents, that died of intestinal and mesenteric tuberculosis. He was able to exclude all other sources of infection and to decide that they had been infected by the ingestion of the milk of tuberculous cows. Hills mentions the case of a child twenty-one months old, of a friend of his, which drank the milk of a highly tuberculous cow for one week while on a visit to his uncle, and three months later this child died of intestinal tuberculosis. Other sources of infection could be excluded. A second child brought up on sterilised milk is still healthy. Hills also reports the death of a boy four years old at Yonkers, New York, from tubercular meningitis. The infection was traced to the milk of two cows of whose milk this boy had drunk, and which proved on autopsy to be tuberculous. Ernst reports the death of three children of one family from tuberculosis. These children had used the milk of a cow which later died of advanced tuberculosis, including the udder. Stalker and Niles report that five persons between twenty and thirty years of age of healthy ancestry died of tuberculosis within a period of two years. On the farm where these deaths occurred they found seventeen cattle suffering from tuberculosis, and other cattle had previously died of this disease. Leonhardt reports the death from tuberculosis of the meninges, intestines, and mesentery of two children fed on milk of a tuberculous cow. Sontag reports the case of a six-months-old child of healthy parents which died of tuberculosis, and which had been fed on the milk of a tuberculous cow. Hermsdorf has reported the case of a child dead of intestinal tuberculosis which had been fed on the milk of a tuberculous cow. Rich reports that a young man of healthy parents, who died of tuberculosis, had used plentifully of the milk of a herd of seventy-four cattle, sixty-five of which were tuberculous, some of them markedly so. Also, another young man died of tuberculosis. Two months later Rich destroyed eighty cattle out of the herd of the family, that is, about 90 per cent. of the entire herd. Also a young woman died of tuberculosis, and a month later the cow whose milk she had used died of advanced tuberculosis. Thorne reports that twenty-two physicians out of 339 practising in Ohio replied in the affirmative to the question, 'Have you been able to trace any cases of tubercular disease to the milk of unhealthy cows?' and that thirty-three replied affirmatively to the question, 'Have you had reason to suspect the origin of tubercular disease in older children or adults to be in the meat or milk supply?' This series of experiments and observations has been selected from literature with the greatest care. Any reports which appeared not to be well authenticated or of a doubtful nature have been excluded. Besides this mass of positive evidence there is much more, that, while not so positive, is not less convincing. It appears that the evidence collected by Thorne from physicians in Ohio is especially valuable, not only in itself, but because it indicates what might be learned by addressing the same series of questions to the physicians of all the States of the Union."

The numerous experiments of feeding animals with tuberculous food or other matter, establish firmly the reality of the danger from the ingestion of such material, so far as animals are concerned. Tuberculosis has thus been transmitted to animals, dogs, for instance, which have a greater power than man of resisting tuberculous infection.

In this country and in many European countries there has been a greatly increased prevalence of tuberculosis among cattle. This fact was brought out by Professor Bollinger at the Congress on tuberculosis which was held in Berlin last May. In connection with this matter he referred to the large increase in the prevalence of tuberculosis among swine, which is due largely to the feeding of the milk and milk-products of tuberculous cows, particularly the separator slime from creameries. In recent years from 60 per cent. to 70 per cent of some herds of swine in Northern Germany fed on this material have become tuberculous. Bollinger also says that in a large percentage—nearly one half—of the cases in which the milk from tuberculous cows has been inoculated into animals, the milk has been found to be infectious. The virulence of the milk is in general proportional to the stage of the disease in the animal furnishing the milk. It is not only in generalised tuberculosis of the cow that the milk is infectious, but in many cases of localised tuberculosis it has also been shown to be infectious.

Mosler touches the same subject with these words:—"Observation has shown that the distribution of tuberculosis among cattle and swine runs parallel with the development of the dairy business. In Denmark and Schleswig-Holstein there is the greatest development of this industry, and at the same time tuberculosis among animals and men is the most prevalent. There is apparently a casual relation between this excessive prevalence of tuberculosis and the feeding to animals of the waste products of the dairies. In swine, particularly, tuberculosis of the liver is very frequent (tuberculosis of the intestines.) In scarcely ten years the per cent. of animals which are affected with tuberculosis has risen from 2 or 3 per cent. to 30 per cent. The most potent factor in this increase of tuberculosis among swine has been the feeding of separator slime."

GLUCOSE AND ADULTERATED SYRUP.

Several small village shopkeepers were recently fined £5 for selling golden syrup not quality demanded. These fines were imposed in order to persuade defendants to take action against the wholesale dealers. The syrup was adulterated from 50 to 95 per cent. with glucose. Without doubt, these poor shopkeepers never heard of glucose.

Those who have to see to the enforcing of the provisions of the Food and Drugs Act seem to act in a most perfunctory and erratic manner, instead of going about their work in a steady, systematic, and rational way. At one time we have the Inland Revenue making a raid on the "four-ale" retailers, the local county analysts on milk, then vinegar, and now golden syrup; then things go on in peace for a time, until the officers under the Act apparently feel they must show that they are doing something to earn their sinecure salaries, and then they have a go at something else—mustard, for instance.

Adulteration in any shape or form is to be condemned, the more so when bolstered up by some incompetent chemist, who, without properly testing the article, declares it to be genuine.

There is far more glucose used in jam manufacture than in syrup, the sale of which, within comparatively recent periods, owing to cheap beetroot sugar, has decreased very much.

How some of the puffing chemists can certify that such a make of jam is make with the best sugar, when the makers in question may be the largest importers of glucose in the kingdom, passes comprehension. Glucose or potato sugar is not cane sugar, and everybody who buys jam buys it on the understanding that it consists wholly and solely of fruit and cane sugar. What about false trade marks put on by the manufacturers both of syrup and jam? What is sauce for the goose is sauce for the gander. If glucose-adulterated syrup is to be condemned, jam ought to follow suit. If the retail merchant is to be fined for selling the adulterated article, the manufacturer should be fined for imprinting a wrong trade mark thereon.—*Oil and Colourman's Journal.*

FORTHCOMING COOKERY EXHIBITION.

The Twelfth Universal Cookery and Food Exhibition will be held this year at the Prince's Skating Club, Knightsbridge, from June 11th to 15th, which promises to be one, if not the most successful Exhibition of its kind.

A powerful and influential Committee has been formed, and a substantial guarantee fund has been subscribed by prominent members of this useful association, whose main effort it is to spread a better knowledge of cookery among all classes.

The Exhibition is under Royal patronage, and has as president Mr. Burdett-Coutts, M.P.; as chairman Mr. J. C. Buckmaster, M.A., and as hon. treasurer Mr. J. Ménager, *chef* to his Majesty King Edward VII. C. Herman Senn will, as hitherto, act as hon. director.

Field-Marshal Earl Roberts, Commander-in-Chief, has given his special sanction for the troops within the London district to take part in the competitions, and as a result the Grenadier, Coldstream, Scots, and Irish Guards, and the Wiltshire Regiment, will take part, giving demonstrations of military barrack and camp cookery. Another interesting feature will be the mercantile marine competitions, in which present and past pupils of the Nautical Schools of Cookery of London, Liverpool, &c., will take part, also a number of boys from the training ships. This is just as it should be, for the questions of food and cookery, both in the Army and Navy, are of the utmost importance.

INSANITARY BAKEHOUSES.

Of all places a bakehouse ought to be pure (says Dr. Wm. Robertson, Medical Officer of Health of Paisley, in his annual report), clean, and airy. What one finds in many instances is a place so stuffy and close that breathing is difficult. The faults that presented themselves were as follows:—There was poor window light; the ventilation was not always of the best; indeed, in one or two it was at a standstill. Now and again I found the plaster work on the roof broken, and the lath bared. The floors were often in a miserable condition, and uneven. It was a perfect treat to enter some of the clean, well-tiled, and imperviously-paved floors of the modern bakehouses, of which there are some good instances. I think if every baker were asked to expose a photograph of his bakehouse it might lead to a good deal of very necessary reform. These are not matters upon which a Medical Officer of Health must keep silent. Silence is golden, I know, but health is more precious than silence. There is the health of the worker and the health of the consumer to be considered. I think it my duty to indicate that in many instances these might be much more easily safeguarded by an improved construction of some of our bakehouses. The law gives us very little power over these bakehouses. There are those, for instance, that can pass muster and no more, and there is another class that cannot be interfered with because they were erected prior to the framing of the Act that we desire to put into operation. I refer more particularly to underground bakehouses.

Other features of interest regarding the bakehouse I need not dwell upon. To cut a long story short, one was declared as unsuitable to be occupied any longer as a bakehouse. Its walls were in a broken-down condition, its floors were unpaved and had big holes in it. The walls were damp, and in every way the bakehouse did not comply with the requirements of the Act. In another case the factors were approached with a view to structural alterations so as to make the bakehouse comply with the Act. In two cases water-closet accommodation was called for in place of disgusting arrangements already in existence. And lastly, the alteration in the plan where a water-closet communicated directly with a bakehouse was demanded. In every instance, I am pleased to say, no objections were raised to the required improvements.

PATHOGENIC MICROBES IN MILK.

Klein describes the results of the bacteriological examination of 100 samples of milk, which were as follows:—

(1) Seven per cent. of the samples of "country" milk produced typical true tubercle in the guinea-pig.

(2) Eight per cent. of the samples of "country" milk produced typical pseudo-tuberculosis (non-acid-fast bacillus of pseudo-tuberculosis, A. Pfeiffer).

(3) One per cent. of milk samples produced diphtheria in the guinea-pig, yielding the typical *B. diphtheriæ*.

(4) One per cent. of milk samples caused a chronic disease (in most cases with fatal results) due to a pathogenic torula, apparently differing in cultural and physiological characteristics from the torula (pathogenic blastomyces) obtained by Sanfelice, Plimmer, and others from human cancer.

(5) Out of the secretions of the cow's udder two pyogenic microbes were obtained, *B. diphtheroides* and *Streptococcus radiatus pyogenes*.

Klein's figures for tuberculous milk (7 per cent.) accord fairly well with our own experience. Our figures have been as low as 7 per cent. and as high as 20 per cent. for different districts.—"R. T. H." (*Treatment*).

TUBERCULOUS MEAT.

Responding to the toast of "The Visitors" at the annual dinner of the Birmingham and District Butchers' Trade and Benevolent Association, Sir James Sawyer, in the course of his speech remarked that if they looked to the history of mankind to everything they knew about the nutrition of the body, they could safely say that the daily consumption of meat was an absolute necessity to the human being. He said this as a physician, as a physiologist, and a man of common sense. It was not as some people would like it, as idealists would frame it, but as Providence had made it. We had only to look at our mouths to see that we were neither vegetarian nor carnivorous animals, but both. This being so, it was to their interest as men of trade, to his as a man of science, that the meat should be pure and good, and in no way calculated to propagate disease. Difficult conditions had at times been imposed by the teachings of science. The medical profession had been sometimes carried away by enthusiasm, had sometimes made mistakes, but it had been actuated by the desire which actuated the members of that trade. Physicians felt that if they limited their work to attempting to cure disease they would be unworthy of their places in the community. They had tried in every way in their power to prevent suffering and disease, and whenever they had approached the trade fairly and honestly they had been received in the same fair and honest spirit. Butchers did not wish to live by selling meat at the expense of the health of the community, and during the last few years, with their co-operation, many improvements had been made. The speaker then alluded to consumption, especially in reference to its connection with the meat trade. It had been conclusively proved of late years, he said, that consumption was due to a minute organism, the tubercle bacillus, but it must not be thought that

tuberculous meat was the chief cause of the propagation of the disease. It was not. Consumption was chiefly transmitted by the inhalation of the germ into the human lungs from the expectoration of persons suffering from the disease, For this to be possible there must be two conditions, the vitality of the seed and the fitness of the soil. There was within those who were healthy and those who took care of themselves some power which could destroy the dread seed. Among the brute creation they found that bovine animals, and more especially cows—because they were "housed"—a special liability to the disease, and under certain conditions it might be transmitted to human beings. They were perfectly right in preventing, so far as possible, the sale of tuberculous meat, but even if it were consumed there was no surety of the propagation of consumption, because cooking was a great safeguard. He said this because, while not wishing to minimise the importance of a pure meat supply, he did not wish it to be believed that tuberculous meat was the chief agent in the spread of that disease.

THE SCIENTIFIC PRODUCTION OF MILK ON A LARGE SCALE.

Milk as a source of disease is well known, and its chief danger is its extreme liability to become infected with the tubercle bacillus. The conditions under which the production of milk is carried on, says the *Lancet*, are gradually passing from the old rule-of-thumb method to the scientific methods of the present day. This change, it may be remarked, does not only secure the production of milk of a non-infective character, but it has also brought greater economy into the methods and results. One of the largest examples of an enormous milk-supplying station in which the production of milk is dealt with scientifically on the score both of hygiene and economy is the establishment of Herr C. Bolle, in Berlin. From particulars recently furnished to us by Sir Otto Jaffe, who has studied the question of milk supply in a number of towns at home and abroad, we learn that Herr Bolle started his business in the year 1871, when he distributed 500,000 gallons of milk, whereas at the present day he supplies milk at the rate of 7,000,000 gallons to about 50,000 families. The milk is all sent out from one central station. The firm supply milk, cream, milk from a special farm for infants, sterilised milk, kefyr, machine-skimmed milk, buttermilk, butter, and cream cheese. In this great central station there are a bacteriological laboratory, a chemical analytical laboratory, and a chemical technical laboratory. In 1899 over 30,000 tests were made in the chemical analytical laboratory alone, and over 1500 guinea-pigs were used in the bacteriological laboratory, mostly for tests of tuberculosis. In the chemical technical laboratory experiments are made upon the by-products of milk which are utilised. Special officers are retained for supervising the 130 farms with their 14,000 cows which supply the central establishment, and the duty of controlling and observing the health of the cows is in the hands of four veterinary surgeons. Till a few months ago the firm passed the greater part of the milk which they collected from the various farms through filters of sterilised gravel which freed the milk of many of its impurities, destroyed many micro-organisms, and tended to keep the milk sweet. Within the last few months, however, they have made arrangements for using an improved pasteurising process for the whole of the milk which they receive with the exception of that which comes from one of their own farms, and they consider this to be one of the most important improvements that they have adopted since the opening of their establishment. They maintain that this process interferes neither with the taste nor with the chemical composition of the milk, but destroys the pathogenic microbes such as those of diphtheria, scarlet fever, tyhus fever, and particularly tuberculosis. The entire establishment, which includes butter, cream, and cheese manufacture on similarly scientific lines, covers more than five and a-half acres. The steam engines develop about 400 horse-power. The cooling plant is able to produce about twenty tons of ice a day. It is stated that the rapid growth of this industry has been accompanied with an excellent effect upon the general milk supply of Berlin; in 1879 14·1 per 1000 of the samples investigated by the police authorities were adulterated, in 1886 only 3·6 per 1000. The infant mortality per 100 living born children in 1871 was 30; this fell in the next 10 years to 27·1, and in 1899 it fell to 23·4. Even if it is also admitted that many other influences have contributed to the decrease of infant mortality, undoubtedly the improved milk supply has had much to do with it. The facts speak eloquently in favour of the scientific preparation and supply of milk and milk products.

HONEY AS A FOOD.

Sir James Sawyer, presiding over the annual meeting of the Warwickshire Bee-Keepers' Association on the 22nd ult., spoke in highest terms of honey as an article of food and also as a natural medicine. He ventured to think that the £70,000 worth of honey which was imported into England might well be raised by English people themselves, and it was a profitable industry. He knew it to be a most nutritious food, and an article to which more than a passing regard should be given.

The Most Nutritious and

. . . the Nicest.

A Free Sample.—A Voucher for a 1 lb. Hovis Loaf will be gladly sent on request.
The HOVIS COMPANY, Ltd., Macclesfield.

"THE LANCET" on

VAN HOUTEN'S COCOA,

"In a recent analysis which we have made,
"the results distinctly indicate the advantage of
"VAN HOUTEN'S PROCESS of manufacture. Thus
"this Cocoa yields a maximum proportion of the
"valuable food constituents of the bean, and what
"is of more importance still, these are presented
"in a condition more easy of assimilation and digestion
"than in Cocoa not so prepared."

CASES IN COURT.

[RECORDS of Police-court proceedings for insertion in the "Food and Health" Supplement should reach us not later than the 10th of the month. Generally speaking, they should be as brief as possible, but where any important point of law is involved a fairly full report is permissible.—ED. S. R.]

Poisonous Mussels.

GEORGE YAXLEY, a Yarmouth fish hawker, was recently summoned for exposing for sale unwholesome mussels. The presiding magistrate was Mr. J. T. Bottle.

The TOWN CLERK, who prosecuted, said that some time since the Corporation became aware that mussels from the river and Breydon water were liable to cause symptoms that gave rise to typhoid fever, and a notification was accordingly issued prohibiting these being sold under a penalty, should such mussels be found to be unwholesome. A purchase was made of a couple of quarts of mussels from defendant's shop at 2d. per quart, the usual price of Stiffkey and other sea mussels being 4d. When these mussels were opened the *colon bacilli* was found which was the forerunner of typhoid fever. In one cubic centimetre of the water inside the mussels there was ascertained to be 803,200 bacteria, which showed that each mussel would contain about 3,000,000 bacteria. The mussels were seriously contaminated, and condemned by a magistrate afterwards as unfit for human food. The Town Clerk said he desired the Bench to support the action of the Corporation. It was absolutely necessary to prevent the population of Yarmouth contracting disease from unwholesome food. Mussels in the river and Breydon water were polluted with sewage, and that fact of itself was sufficient to render them unwholesome. There might be some sympathy with defendant in this case on the ground of ignorance, but this plea could not be advanced in future.

Inspector Hassell described the purchase of the mussels, which he said were small and dirty, resembling river mussels. He sent a sample to Dr. Pakes at Guy's Hospital, London, exhibited the others to the Medical Officer of Health, and afterwards to Mr. S. W. Spelman who, as a magistrate, condemned them.

Dr. Russell, the Medical Officer of Health, said he had examined the conditions under which mussels in in the locality grew, and he considered them unwholesome food. Undoubtedly there had been cases of typhoid fever attributable to these mussels. He inspected those obtained by the Sanitary Officer, and they were sewage polluted. He caused warnings to be issued by bills posted throughout the town.

The TOWN CLERK said this was as far as he could carry the case that morning, as Dr. Pakes could not attend. It was hoped that in the near future they would be able to make these bacteria examinations locally and obtain the information for the Bench.

Mr. T. Green: From your knowledge of these mussels do you consider they are of a highly poisonous nature?

Dr. Russell: I do, certainly.

The CHAIRMAN: What have you to say?

Defendant: I catch these mussels in clear water up Breydon, three miles from Yarmouth Bridge.

The CHAIRMAN: But the evidence is that they are very poisonous.

Defendant: I did not know it.

The CHAIRMAN: This is the first case and we shall not punish you. We hope it may be conveyed through the Press as a warning that these mussels are as poisonous as anything can possibly be, and likely to

cause disease. Therefore, if anyone else is found offering such mussels for sale they will be dealt with severely, because the health of the inhabitants of the borough is at stake.

THE EXPERT'S CERTIFICATE.

Dr. Walter C. C. Pakes, D.P.H. (Camb.), F.C.S., of the Public Health Laboratory, Guy's Hospital, in his certificate, said: "On February 20th, I received a tin containing a number of mussels. Upon arrival the box and its contents were quite cold, the temperature during transit, upon February 19th, being low. The mussels were, so far as the naked eye appearances could show, sound. Eight of the mussels were selected from different parts of the box, in order to avoid examining those which had been lying together. They were all opened under strictly antiseptic conditions, and from each mussel was taken either some of the water contained in the shell, or a portion of the mussel after it had been cut free from the shell and washed in sterile water. From two mussels the water was examined, and portions of six mussels were treated in the manner described. From each sample of water and from each portion of mussel typical *colon bacilli* were isolated. The number of bacteria present in one cubic centimetre of the water in the shell was 803,200. There can be no doubt that the mussel beds from which these mussels are taken are very seriously contaminated with sewage matter, and the mussels themselves must be looked upon as dangerous to the health of those who consume them."

Bad Meat At Burslem.

At the Burslem County Police-court a butcher named Henry Clarkson, of Wetley Rocks, was charged with having exposed bad meat for sale in the Burslem Meat Market. The prosecution was instituted by the Corporation, and conducted by the Town Clerk (Mr. A. Ellis), while Mr. E. A. Ashmall was for the defendant.

Wm. Martin, Sanitary Inspector to the Burslem Corporation, said that he saw a carcase of beef on the stall of the defendant in the meat market. The meat was wet, soft, emaciated, and poor, and was without fat. Certain portions of the carcase had been removed, including the pleura and the diaphragm. The defendant told him that the meat was that of a Cheshire cow which had cost £8, but had "done bad." The total weight of the meat exposed was 419 lb., and having seized the meat the witness had it examined by Mr. Wood, J.P., who condemned it. The meat was also examined by several persons, and in the presence of the defendant on Saturday a large tumour was removed from the breast bone. The following day other tumours were removed from the meat, showing that the beast had suffered from tuberculosis. The kidneys smelt very badly, and one of them was diseased.

Mr. J. T. Allen, veterinary surgeon said he had examined the meat exposed by the defendant. It was soft and badly nourished, and all through the glands there were tubercular growths. Dr. Youngson also gave evidence, confirming the previous statements as to the prevalence of tubercular nodules, and expressing the opinion that the meat was quite unfit for food.

Mr. J. Sargeant, a butcher, who was present when the meat was examined by the Inspector, said that the meat was in such a condition that a butcher could at a glance see that it was unfit for food. A labourer, Leonard Johnson, who was present when the defendant slaughtered the animal, said that when the udder was cut a mattery kind of milk issued.

Mr. Ashmall urged the magistrates to deal as leniently as possible with the defendant, who had lost the sight of one eye, was suffering from an injury to his hand, and his general condition was poor.

It was shown by the police record that the defendant had been convicted of a similar offence eleven years ago.

Mr. Brough said this was as bad a case as had been before the Court. When meat of such a diseased nature was sold, the health of a very large number of people was threatened. The prisoner would have to go to prison for three months, and to pay the costs. In default of the payment of the costs another month's imprisonment would be added.

Glucose in Marmalade.

George Smith, a grocer of Worthing, at the West Sussex Quarter Sessions at Horsham, appealed against his conviction by the local magistrates for selling marmalade adulterated with 13 per cent. of starch glucose.

Much scientific evidence was given for and against the contention that glucose was not injurious to health.

Mr. Thomas Francis Blackwell, chairman of Crosse and Blackwell, deposed that seven years ago his firm found that there was a public taste for jams with glucose, and they were bound to meet it.

Mr. Thomas Pink said his firm had for twenty years used glucose, which greatly improved jams.

The Bench decided that the conviction must be upheld. They did not consider that glucose was injurious to health, but the added substance constituted an offence within the section of the Act.

The Bench agreed to state a case.

Unsound Veal in Glasgow.

At the Central Police-court, Walter Keir, 32, York-place, Perth, pleaded guilty to having consigned a calf which was unfit for human consumption to James Anderson, meat salesman, Glasgow.

The agent for the defence admitted that the calf was lame; that it was imperfectly bled; and that it had been slaughtered in his own premises instead of in the public slaughter-house in Perth, but tendered the excuse that his client was ignorant of the laws.

The Fiscal pointed out that in this case the whole of the internal organs had been taken out, this being against the usual practice of the trade.

Judge Battersby imposed a penalty of £5, with the alternative of thirty days, and remarked that the health of Glasgow must be considered, and if accused was ignorant of the laws it was his duty to make himself familiar with them.

How to Choose a Fish.—A fish-market man gives this simple rule for fish buyers to follow if they would secure fish that is eatable and certainly free of the ptomaines of which so many fish lovers stand in dread: See that the flesh is so firm that it will not be dented on pressure by the fingers, that the eyes are full, the scales bright, the fins stiff, and the gills are of the brightest, neither pale nor a dark liver colour. Then, if there is no odour to the fish, it may be eaten with safety.

Formaldehyde Gas for Disinfecting Books in Libraries.—For some time past the belief has been current that diseases are contracted by handling books in public, which have become infected with the germs of some disease. The New Jersey Authorities have been the first to take preventive steps, owing to a case of scarlet fever, which had been shown to be transmitted by the agency of a book in a travelling library. Professor Mitchell, of the New Jersey State Board of Health, has been conducting a number of experiments with formaldehyde gas, using kindergarten toys and public school books, and so far it has been found the surest destroyer of microbes, working quickly and effectively.

Food & Health

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FOOD ADULTERATION IN ITS RELATION TO THE PUBLIC HEALTH.

Among the many factors which have a great influence upon the health of the individual there is none more potent than food.

Often even wholesome foods may be administered in such a way or in such excessive quantities as to injure the health of the consumer. If this be true, how much greater must the danger be if the food offered for consumption be changed in its nature, so as to become a positive poison, by the addition of foreign bodies?

It is well known that flour made from wheat has been largely adulterated by the addition of purely starchy matter derived from Indian corn. Now, starch cannot be regarded as injurious to health, and hence the addition of a starchy body to the flour of wheat is in this sense not an injury. Physiological chemists, however, have discovered that there is a certain balance in the foods of man which should not be disturbed. In other words, there is a definite relation between the quantities of proteid, fat, and carbohydrate matters which, when sustained, renders this mixed food most nutritious, and therefore most economical. Bread made from wheat flour, especially if it be made as nearly as possible from the whole grain, is recognised by physicians and physiologists as being practically a complete human food, with a certain definite ratio existing between the proteid matter which it contains and the fats and carbohydrates. It is evident at once that the addition of other starchy matter will disturb this ratio and thus render the food less economical, by increasing enormously one of its constituents without changing the quantities of the others. For the ordinary healthy stomach such a change in the food would be of no consequence whatever, but we can readily imagine cases where with the disturbed digestion and imperfect secretion of the enzymes which produce fermentations characteristic of the digestive process, the increase in the amount of starch would produce a positive injury. We know that starch is digested first in the mouth by the action of the enzymes of a diastatic nature, secreted by the salivary glands. The slight alkalinity of the digestive fluid favours the action of the salivary enzymes. When the food reaches the stomach, in natural digestion, it becomes acid under the action of the hydrochloric acid secreted by the glands of the stomach. The enzymes of the peptic ferments are also secreted in large quantities, and act rapidly upon the proteid matter of the food, converting it into peptone. This action is favoured by a slight acidity. It is evident, therefore, if the digestion of the starch does not proceed under the most favourable conditions in the stomach, any excess of starchy food may interfere seriously with proteolysis. In other words, the amylolytic ferments and the proteolytic ferments do not reach their maximum activity in the same environment. The mixing of Indian corn starch, therefore, with wheat flour, while it is an adulteration of the first class, being the addition of a harmless or innocuous substance, may in the cases mentioned above become a positive injury to health.

Another illustration which may be cited is in the case of the glucose of commerce. Now, the glucose of commerce is a mixture of dextrose and dextrin with a small quantity of maltose, produced by the artificial hydrolysis of the starch under the influence of an acid. It is well known that the starch in foods must undergo a similar hydrolysis, under the action of the diastatic ferments of the digestive organisms, before it can be assimilated and act as a nutrient for the body. From this fact it might be inferred that a partial previous digestion of the starch, by an artificial hydrolysis such as is referred to above, might be of advantage. This, however, cannot be seriously admitted. It is a well established principle in physiology that the disuse of organs tends to produce atrophy and eventually functional paralysis. Hence, if the starchy foods are replaced by artificially digested starch, the organs which produce the diastatic ferments to hydrolise the starch are deprived of a part of their functions and must suffer from disuse. It is evident, therefore, from this point of view, that the use of predigested starch is to a certain extent prejudicial to the health of the digestive organs. Where the digestive ferments are deranged and the digestion of starch rendered difficult, the addition of predigested foods may be useful, but these should not be substituted for the natural foods, except on the recommendation of a competent physician. Again, there may be objections to the use of glucose from another point of view. This substance is, as is well known, largely used as an adulterant for honey and jelly. Honey owes its value to the peculiar flavour which it possesses, due to the aromatic substances derived from the flowers, and possibly to traces of formic acid obtained from the digestive organs of the bee. In other words, honey is not prized simply because it is a carbohydrate, but because of its flavour. Whenever, therefore, glucose is added to honey, by the substitution of it for the aromatic substance above mentioned, the peculiar flavour is destroyed and the honey is to that extent less desirable. So here is another instance in which the introduction of a perfectly harmless substance into food may render it positively injurious.

When we come to the second class of adulterations there is less ground for dispute. No physician will fail to condemn the use of bodies in foods which are positively injurious. The excuse usually urged for the use of these bodies is that they are in such minute quantities that they cannot possibly be injurious. This I readily grant is valid for healthy stomachs, of individuals who are in the prime of life and who are in the full possession of all their powers, but it can hardly be general in its application.

Adulterants of this class are best illustrated in the use of preservatives. For economical reasons foods are not always consumed on the spot where they are produced nor at the time of their production. Many foods are of a perishable nature, and if not consumed at the time of their maturity are lost. To render these foods serviceable through the entire year, and in localities widely separated from the place of their origin, some method of conservation must be employed.

There are two methods of food preservation which are perfectly natural and permissible. One consists in the complete desiccation of the food so as to prevent the fermentation which produces decay.

The second method is to subject the food to a Pasteurising or sterilising temperature for a time sufficiently long to destroy the germs of fermentation. The foods thus Pasteurised or sterilised are prevented from coming into contact with the air, and thus by excluding the fermentative germs they can be preserved indefinitely. Both of these processes are to a certain extent troublesome and expensive, and hence dealers in foods have sought to accomplish the same result by a shorter and easier course, namely, the employment of certain chemicals which have the property of retarding, paralysing, or destroying the activity of the fermentative germs. All food preservatives act essentially in the same way.

It is well known that there are a great many substances possessing neither taste nor odour which have this retarding action upon the fermentative germs. The addition of these bodies to foods secures their preservation and at the same time does not impair their flavour. Among the preservatives which have been commonly employed in this way may be mentioned sodium sulphite, boracic acid, borax, potassium nitrate, sodium chloride, sodium silico-fluoride, potassium fluoride, sulphurous acid, formaldehyde, salicylic acid, benzoic acid, abrastol, and saccharin. A glance at these substances will show

that they are of two general kinds, those of an inorganic nature, which are mentioned first, beginning with sodium sulphite, and those of an organic nature, beginning with formaldehyde.

It will be noticed that some of the bodies in the first class are of a condimental nature, and therefore cannot be rigidly considered as food preservatives. We must not exclude from foods the condiments with which we are familiar. They are necessary and desirable, although being of themselves of little food value, and hence the use of any one of the bodies mentioned above, in a condimental sense, cannot be considered reprehensible. Those which are most commonly used as condiments are common salt and potassium nitrate, the latter, however, to a very limited extent.

In the second class the only one which is used in the condimental sense is saccharin, and that only as a rule in the case of persons suffering from diabetes, where the use of a carbohydrate in the food is deemed inadvisable, and where the patient craves a sweet taste in his food.

In general it may be said that all decay of foods is due to germ action. It was at one time supposed that the decay of organic matter was due to oxidation of the air, but since the time of Pasteur this idea is no longer entertained. The sole function of the addition of preservatives, therefore, is to paralyse or suspend the germ action and thus preserve the foods from decay. On the other hand, we should not forget that the process of digestion is essentially a fermentation from beginning to end. The splitting up of the organic food elements in simpler forms, which can be assimilated and utilised in the system, is due solely to the action of ferments belonging to the general class of enzymes.

The decay of foods is due to fermentative action, caused by organisms capable of reproducing their kind, and to the enzymes which are secreted by the living organ. The process of digestion in the alimentary canal is due almost solely to the latter cause, the action of the germs capable of self-reproduction being extremely limited, and even doubtful. It may be stated, however, that any substance which has the property of suspending or retarding the action of germs capable of reproduction has a similar action upon the enzymic ferments. Therefore it follows that when these substances which are added to preserve foods reach the alimentary canal, their paralysing action will continue during the process of digestion. Hence this broad principle should be enunciated as being definitely established, that all substances which are capable of preserving foods have also the property, to a certain extent, of retarding the processes of digestion.

The question therefore arises, Should the use of preservatives in foods be absolutely prohibited? So far as the public health is concerned, it would be sufficient to permit the use of the least harmful preservatives, on the condition that the kind and amount of the preservative employed be marked in plain letters on every package containing it.

It is claimed by many competent hygienists and physiologists that a moderate use of borax or boracic acid in butter is of a condimental as well as of a preservative nature, and does not in any way tend to interfere with the process of digestion. Claims made in this manner are worthy of consideration.

There is one other form of food adulteration to which the attention of this body should be called, and that is the artificial colouring of foods. Artificial colours are now used to a large extent in human foods, chiefly in butter and oleomargarine, canned meats, and preserved vegetables. Butter and oleomargarine were formerly coloured yellow with turmeric. The introduction of the coal-tar dyes provided a cheaper colouring matter, and one of the azo dies, tropæolin, which gives a bright yellow colour and at a smaller expense, has almost entirely replaced the vegetable colouring matter first mentioned. As a result of this use, turmeric has practically disappeared from the dairy and the synthetic yellow has taken its place. Coal-tar compounds should be regarded as practically in the same category with the organic preservatives above mentioned.

For the colouring of sausages and preserved meats the coal-tar products are chiefly employed. The following is a list of some of the colours which have been used:—Bismarck brown, buffalo brown, double scarlet fuchsin, and a red colouring mixture composed of common salt, sodium nitrate, borax, and carmine.

The addition of nitrate of soda and nitrate of potash to sausages and meats tends to preserve and at the same time to intensify the red colour of meat. Potassium nitrate is uniformly employed by all packers of corned beef, so that it may be considered as a normal constituent thereof.

The green colour of peas and beans and other green vegetables, which are preserved by sterilisation, is fixed by the use of zinc and copper salts. These bodies act as a mordant, entering the tissues of the green plants and fixing the chlorophyll, by preventing its transformation into xanthophyll, which would otherwise occur on long keeping. Green peas which are Pasteurised without the addition of zinc or copper become yellow by the production of xanthophyll, while if zinc or copper salts be employed the green colour is preserved indefinitely. It is well known that zinc and copper salts are not particularly wholesome, hence their use in preserved vegetables is to that extent reprehensible. How far we should sacrifice our æsthetic ideas, as to what food should look like, to purity, must be determined by each one for himself. It would be a sufficient protection to the public to require that every package of preserved vegetables containing copper and zinc salts should have that fact plainly marked upon the label.

Examples of food adulteration which arise from the extraction of some valuable ingredient from the food, and the substitution of a less valuable ingredient, are also very numerous. In the removal of cream from milk inspection is so rigid as to practically prevent adulteration. The laws of most of our large cities require that the milk offered for sale shall contain not less than a certain quantity of fat; the minimum limit is usually three or three and one-half per cent. The content of fat in the milk from a Jersey herd of cows often reaches five per cent. It is thus seen that the thrifty dealer can remove two-fifths of what the natural milk contains, and yet sell his article in conformity with the statute. Nevertheless, the removal of this amount of fat is in every sense of the word an adulteration, and should receive the same punishment as if it were extended until the limit fixed for the fat had been transgressed.

The use of skimmed milk in cheese-making, with the addition of lard and cottonseed oil, is another illustration. Another common substitution is that of cottonseed oil for olive oil, which has been practised to an enormous extent in this country. This is a clear case of adulteration which is not injurious to health. Cottonseed oil is perfectly wholesome, as much so as olive oil.

The fraud in this instance is purely a monetary one, but the offence is just as great, and the punishment should be as severe.

From this brief summary of some of the methods of food adulterations it is clearly seen that the practice of frauds of this kind is usually more to be regarded from a monetary point of view than as prejudicial to the public health.

The sole objects of food adulteration are to sell an inferior article at the price of a superior one, and to preserve a good article so that it can be sold after preservation at the same price or at a higher price than it would bring in its natural fresh state; and to secure this object reprehensible methods are employed.

Foods should be sold everywhere for what they are,

while the greatest liberty is granted in their manufacture and preservation compatible with the public health. Only where actual injury is done should prohibition be practised, but up to this point a plain marking of the food containing preservatives or adulterants of any kind would be entirely effective.

MILK CONTAMINATION AND HOW BEST TO PREVENT IT.

In order to fully appreciate the painstaking work necessary to prevent milk contamination, it is requisite that all the details of its production and transportation be thoroughly understood, as well as the element of time taken in handling it taken into consideration, for it is well known that milk of a very good quality soon deteriorates, even where the most perfect practical methods are used for its preservation.

The subject may conveniently be arranged under two divisions, namely:—First, Methods of contamination; secondly, Prevention of contamination. First, Methods of contamination can be subdivided into (*a*) diseases affecting cow, her food and surroundings; (*b*) contamination while being milked and prepared for shipment at the dairy; (*c*) while being transported and delivered to consumer; (*d*) after milk is in consumer's possession. Secondly, Prevention of contamination covers a wide field, and can only anywhere near approach perfection by constant, intelligent supervision from the pasture field, watering place, and food trough to its final delivery to the consumer, and after it is in the consumer's hands, by general education of the masses in hygiene in general.

In regard to diseases liable to affect the cow, of course tuberculosis holds first place, and in some localities seems to be present to an almost alarming extent.

It is a well-known fact that a cow can be affected with tuberculosis and yet give non-tubercular milk; in fact, is not liable to do so unless extensive general tuberculosis be present, or else tuberculosis of teats, milk glands, or udder exists. It would seem the sensible thing to do, to examine milk and destroy the animal only when she gives milk containing tubercle bacilli, instead of the expensive, not to say questionable, proceeding of slaughtering them because they react to the tubercle serum.

Is there great liability to contract tuberculosis from the use of milk that occasionally contains tubercle bacilli? Or, putting it more strongly, is tuberculosis disseminated in the human being by use of tuberculous cow's milk?

We have no direct evidence of such a result, and the bacillus found in cow's milk is not exactly the same as that found in human tuberculosis. Primary intestinal tuberculosis is uncommon in the human being, which would not be the case if it was at all generally produced by milk consumption. Hydrochloric acid or gastric juice is very destructive to the bacillus, and probably under ordinary conditions few, if any, pass through the stomach alive, and, providing some do, they hardly would infect from the intestine if mucous membrane was intact. We do not deny the possibility of infection, but the practical question is, how large a proportion of those using tuberculous milk become affected? This can only be answered, in the light of facts before us, by saying that there are not nearly as many as alarmists would have us believe. The writer's opinion, based upon years of observation, is that children who consume much milk during early life, say up to fifteen years of age, are better equipped physically, having less skin and digestive diseases, and really have a lower mortality from all causes, tuberculosis included, than those deprived of this useful food. Cattle are, of course, liable to acute diseases, but, fortunately, give but little milk during an attack, and the same may be said of most chronic diseases, tuberculosis being the main exception. The disease of milk glands known as garget is quite common, and the average farmer thinks such milk not sufficiently bad to warrant throwing it away, and into the can it goes.

New milk (that is the secretion of milk glands for first two or three days after dropping calf) is not generally considered fit for use, but quite generally goes in to enrich the mass sent to cities.

Milk, sometimes even deadly in its virulency, is many times the result of food taken. Digestive diseases are most common during periods of drought, when cattle are obliged to eat weeds and plants which they avoid when grass is abundant. Those fed on malt and refuse from breweries and distilleries come under the same heading. There should be care of the cows not only in regard to food and water, but also in relation to construction of stables, ventilation, light, bedding, condition especially of stable floor (the latter often are afloat on a reeking mass of filth in latter part of winter and spring months, and in such cases the cow is usually pretty well plastered). This is not overdrawn, but is supported by facts altogether too numerous. Can milk from cows in such surroundings be a good article?

Probably the most prolific source of contamination occurs while milking is being done. Who ever heard of a milkman washing his hands before milking? Most of them wait until they are actually doing the work, and then wash them in the milk. Many milkmen think they cannot milk without first wetting teats with milk, and consequently persist in this filthy habit. Water is not usually handy to milkyards or stables, consequently udders and teats rarely get washed.

The cow is a restless creature, especially inclined to be uneasy while being milked, occasionally kicks and now and then plants a filthy foot in the milk pail. (Such milk is usually strained before going into the can.) Hair, insects, hay, straw, blood, pus, particles of earth, and more or less cow manure constitute the most common foreign elements that get in at this time. It cannot be entirely prevented, but can be very much lessened if only more care were taken, and result of the evil more generally appreciated. Also, at this time, milk often has been made deadly by contamination with disease germs. They get into the milk in a variety of ways; most common, perhaps, is that by washing utensils with infected water. Scarlet fever, diphtheria, and typhoid are no doubt often produced by the use of milk so infected. Scarlatina is unknown in countries where cow's milk is not used for food, which many authorities think is due to this source of transmission being absent. A common source of trouble comes from improper cleansing of utensils at this time, minute particles adhering to cans, pails, &c., being a nidus for rapid bacterial development in fresh milk that is added. Milk may contain enough butter fat, solids, be strained, and yet be very bad from this cause alone.

Methods of contamination while in the hands of the dealer are mainly from removal of covers from cans for various purposes, thereby allowing particles of dust and various other minute substances to gain entrance, and quite generally such substances favour bacterial development. After the milk is in hands of consumer the methods of entrance of impurities are many; the most common are from unclean dishes, keeping in living rooms, exposure to disease germs, and lack of proper facilities to keep correct temperature.

Methods of prevention of contamination that might and should be faithfully and earnestly carried out are many. Hygienic laws that are useful generally are especially useful here, and when more generally understood, milk inspection will be greatly simplified.

Examinations for germs aside from tubercle would not be necessary if the foreign substances were kept out.

It is not that the producers and handlers of milk do not understand these matters generally pretty well, but they are careless about their proper enforcement; they do not fully realise the great disaster that might easily follow carelessness or dishonesty in any minor detail.

The trite saying, "Eternal vigilance is the price of liberty," might apply here if changed to "Eternal vigilance is the price of pure milk."

CASES IN COURT.

[RECORDS of Police-court proceedings for insertion in the "Food and Health" Supplement should reach us not later than the 10th of the month. Generally speaking, they should be as brief as possible, but where any important point of law is involved a fairly full report is permissible.—ED. S. R.]

Milk Adulteration and an Appeal.

THOMAS RICHARDS, of Fetter-lane, London, was summoned recently for selling milk adulterated with 18 per cent. of added water.

Mr. HENRY CORBETT JONES, Town Clerk to the Metropolitan Borough of Holborn, appeared in support of the summons. Mr. E. O. JONES defended.

On the last occasion the defendant produced the certificate of an analyst to whom he had submitted the sample which, in accordance with the usual arrangement, was left with him. The analyst reported the milk to be of rich quality, and the summons was adjourned for the third sample to be examined by the Somerset House analyst. That official now reported that the milk was diluted by at least 18 per cent. of added water, but he added that the sample bottle containing it was sealed in such a way as to enable the stopper to be removed and replaced without breaking the seal or cutting the string.

The Solicitor for the defence contended that all the milk vendors in London would be in peril if their cases were to be decided on milk contained in bottles the stoppers of which might be removed at pleasure.

Evidence was given to show that neither of the samples relied upon by the prosecution could have been tampered with in any way. The Magistrate ordered the defendant to pay a fine of £20 and 12s. 6d. costs.

Notice of appeal was given.

Pure Country Milk.

AT the North London Police-court, Henry Hollier, a farmer, of Street-hill Farm, Twyford, Leicestershire, was summoned, before Mr. FORDHAM, at the instance of the Islington Borough Council, for sending milk to London which was adulterated.

Mr. BRAMALL prosecuted for the Council, and Mr. SIMPSON defended.

Mr. Alfred Ray Abbott, member of the firm of Abbott and Son. milk contractors, of Digby-road, Homerton, said that on October 4th, 1900, his firm entered into a contract with defendant for a daily supply of milk, which was to be pure and have the full amount of cream, and which was to be delivered at the Finsbury Park Station. In consequence of one of the firm's customers having been fined at that Court for selling adulterated milk, the Sanitary Authorities were communicated with.

James Cowling, one of the inspectors employed by the Islington Borough Council, said that in consequence of the last witness's communication he visited Finsbury Park Station on the 12th, 13th, and 19th of March, and on each occasion took samples of milk which had been consigned by the defendant to Messrs. Abbott. The first sample contained 22 per cent., the second 33, and the third 35 per cent. of added water. On March 19th the witness was at John o' Gaunt's Station, near Twyford, and he saw the defendant arrive with three churns of milk. He took samples from each. Two of the churns turned out to be perfectly right, and the third (churn 6004) showed adulteration to the extent of 35 per cent. of added water. The defendant said that this churn came from another farmer named Pym, and he also mentioned the numbers of the churns from which the adulterated milk had been previously taken as having come from the same person. In consequence of this statement the witness communicated with the Sanitary Authorities at Melton Mowbray, and a sample was taken of milk which Pym meant to go with the defendant's milk to London. This on analysis was shown to contain 40 per cent. of added water. For this Pym was fined £5 at Melton Mowbray.

Frederick Pym, grazier, of Twyford, in reply to Mr. Simpson, said that he was in the habit of selling Mr. Hollier a quantity of milk daily to make up the quantity he had to supply to Abbott's. The defendant paid him what he received, only deducting 1d. per gallon for carriage to the railway station. The witness did not dispute the assertion that the milk in the condemned cans had been supplied by him, but some of the defendant's milk had been added.

Mr. SIMPSON: Thus improving the quality. I can from the books show the exact amount of my client's milk in the churns each day, and comparing this with the percentage of 40 per cent. of added water in the milk found on Pym's premises, it entirely proves what I say.

Mr. SIMPSON added that the defendant was a man of

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the highest respectability, and although he was technically liable, he was the victim of Pym.

Mr. FORDHAM said that he believed Hollier was more sinned against than sinning, and that he had been taken in by his neighbour. Had he believed that the defendant had watered the milk, he should have imposed the full penalty in each case. As it was, on one summons he would have to pay £1, with £7 7s. costs, and on each of two others 5s. with 12s. 6d. costs.

Exposing Diseased Meat at Northampton.

THOMAS WILLIAM STILL, butcher, 5, Marefair, was summoned for exposing for sale, on the 9th ult., beef unfit for human food.

Mr. W. B. SHOOSMITH prosecuted on behalf of the Corporation, and Mr. G. JASON PHILLIPS defended.

Frank White, Inspector of Nuisances, deposed to visiting Still's premises about midday on the 9th, and to seeing there four pieces of beef which were obviously unfit for food. The beef appeared to have been taken from an emaciated carcase; the lining membrane of the ribs was stripped, and a small portion of that which remained bore traces of tubercular disease. Witness seized the meat and took it to the Health Officer, where it was condemned by a magistrate and destroyed. The total weight was 38 lb. When witness seized the meat, defendant said that the meat was all right, and that it came off an animal which he had bought as "a blown cow." A blown cow was an animal which was suffering from tuberculosis, and which had been fed on dry food. Still stated that the cow cost £5. A cow in ordinary condition would cost £12.

By Mr. PHILLIPS: Three of the four pieces of beef which witness seized were fully exposed for sale, hanging over the window-board in fact.

Mr. Lee F. Cogan, Medical Officer of Health for the Borough, deposed that the meat was in a diseased condition, and decomposition had set in. Witness had to remove pieces of fat to discover some of the traces of disease. The fat appeared to be that of a healthy animal. The meat was certainly not fit for human food.

For the defence, Mr. PHILLIPS said that Mr. Still bought the animal, which no doubt was ailing, suffering from tuberculosis, but after it had been properly slaughtered it was exhibited in Mr. Still's shop, in the most prominent place in which it could be exhibited, and part of it was eaten by Mr. Still's wife. What better proofs of good faith on the part of the defendant could they have than those? Until a recent date, the carcase of an animal which had suffered from tuberculosis was not regarded as unfit for human food. Defendant had acted in good faith, although he might have been more cautious.

Mr. Spokes, farmer, Upton, said that after a veterinary surgeon had pronounced the animal, on March 28th, to be suffering from indigestion, he sold it to defendant on April 1st. Witness saw the carcase and considered it good for human food. Witness did not observe any traces of disease on the meat; it was certainly a bit "grapy."

Cross-examined: Witness did not know until that morning that "grapes" and "tuberculosis" were identical.

James Groom, the butcher who dressed the beast on April 1st, said that when dressed the meat appeared "good enough for any one."

Arthur Grissell, another butcher, did not think there was anything to complain of as to the state of the meat.

Defendant deposed that, so far as he knew, the meat

was fit for human food. Witness sold some of the meat to his wife's father and mother.

By the BENCH: Witness sold a side of the beast to a butcher named Robbins.

The Chief Constable, in answer to the Bench, stated that in July last defendant was fined 40s. and costs for exposing unsound meat on the Market-square.

Fined £5 and costs.

Foreign Butter and Alleged Adulteration.

AT the Thames Police-court the Anglo-Continental Produce Company, of Tooley-street, Southwark, were summoned before Mr. MEAD, for importing into St. Katherine Dock, butter which had been adulterated with not less than 10 per cent. of fat other than butter fat, and the package was not conspicuously marked with the name or description indicating that it was adulterated, contrary to Sec. 1 of the Food and Drugs Act, 1899.

Mr. DALBY and Mr. R. S. ROBERTSON, instructed by the Solicitor of His Majesty's Customs, prosecuted; and Mr. MACMORRAN, K.C., and Mr. RICARDO appeared for the defence.

For the prosecution it was stated that on the 4th of February last the steamship Viola came into the St. Katherine Dock from Hamburg with a mixed cargo, amongst which were two consignments of so-called butter. Samples were taken in accordance with the directions of the section, and a sample was analysed by Mr. Lewin, Chief Chemist of the Government Laboratory. That gentleman, on examination, found that the consignment contained more than 10 per cent. of fat other than butter fat.

Mr. MACMORRAN, K.C., on behalf of the defendants, said the case was one of considerable importance, and was the first under the new Act of 1899, which rendered the consignee liable to heavy penalities if the article was found to be adulterated. It was, therefore, necessary that the utmost care and attention should be bestowed on the case. In addition he should be in a position to show that the standard laid down by Mr. Lewin would practically exclude from the markets of this country Russian and Siberian butter, in which a very large trade was done. While not wishing to introduce anything to suggest that Mr. Lewin had not made a proper analysis, he should show different figures given by persons of high reputation, and these would prove that the result was not inconsistent with perfectly genuine butter. Mr. Otto Hehner and Dr. Richmond would tell them that butter undoubtedly genuine produced much lower figures. They would also have it in evidence that the butter from which the sample was taken came direct from Siberia and was not shifted at Hamburg. He would call a gentleman from Russia, who gave evidence by authority of his Government, to show the condition under which the butter was made. In winter the milk was poor and small, and butter was consequently affected. In addition, Dr. Allen, who had made experiments at the instance of the Danish Government, would tell them with regard to continental butters, and more particularly with regard to Russian and Siberian, that the standard was low. Mr. Lewin told them he had found crystals which was inconsistent with being genuine butter, but he was in a position to show that in Siberia and Russia, when butter was allowed to cool rapidly, crystals would be produced. He suggested that the percentage of margarine was very small, and in genuine butter much lower figures had been obtained. In winter time the butter fat in milk got less and less, and experiments showed that from the 7th of September to the 1st of November figures went down from 5·1 to 4·1, so the standard laid down by Mr. Lewin—4·6—was one which could not be properly fixed. He also pointed out that there was not a margarine factory in Russia where it would not cost more to make than butter itself, consequently they had a right to infer the improbability of adulteration.

Mr. Hehner, Mr. A. H. Allen (analyst for Sheffield and West Riding of Yorkshire), and others having given evidence,

Mr. MEAD thought the case was not made out, and dismissed it.

Batch of Adulteration Cases at Westminster.

SEVERAL summonses under the Food and Drugs Acts were for hearing, before Mr. SHEIL, at the instance of Inspector Perrin, on behalf of the Lambeth Borough Council.

The first was against Susannah Lewis, of Vauxhall-walk, S.E., for selling milk from which 10 per cent. of the original fat had been abstracted.

Looking at the certificate of the analyst handed up, Mr. SHEIL said he did not think it in proper order. There was nothing to show that the fat had been abstracted; it was deficient, and that might be the nature of the thing. He should dismiss the summons. His Worship added that he thought these cases should be conducted by a solicitor.

A second summons against the same defendant was for exposing margarine for sale without a proper label attached.

Looking at the section of the Act under which the proceedings were taken, Mr. Sheil said it referred only to packages, not to a tub. The defendant should have been summoned for selling margarine as butter. This summons would also be dismissed.

A similar summons against Mary Ann Jones, also of Vauxhall-walk, was dismissed on the same grounds. Mr. Perrin said he had never before had any difficulty in such cases, in which he had proceeded in the same way.

Margaret Hughes, Princess-road, Lambeth, was fined 20s. and 12s. 6d. costs for selling milk which had been adulterated with water to the extent of 6 per cent.; and William Davis was fined 20s. and 12s. 6d. costs for selling as coffee a mixture containing 50 per cent. of chicory.

THE VALUE OF CONDENSED MILK.

CONDENSED milk has been so much abused by some practitioners that it is interesting to find that in this, as in all other matters, doctors differ. Dr. Edson recently expressed himself very strongly in favour of the use of condensed milk for infants as a substitute for mother's milk. "What is wanted," he says, "is a food that is nutritious, wholesome, uniform, readily procurable, not unreasonably expensive, and that will keep fresh and sweet under all circumstances. The article that best answers all these conditions is condensed milk put up in cans and sufficiently sweetened to preserve it. This is the one point that I wish to emphasise in this instance, that in canned condensed milk we have an article that fully meets all the requirements of bottle-fed children." He says he has never heard of any series of cases where it has been used faithfully and intelligently and proved a failure. He does not regard the fact of its being sweetened as constituting any objection to it. He lays great stress upon the importance of its being sufficiently diluted and prepared fresh each time that it is wanted. For a very young infant he recommmends a teaspoonful of the milk to fifteen of water and two of lime water, with just a trace of salt. The degree of dilution may be gradually diminished after the child is three months old.

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Food & Health

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PREVALENT PROCESSES OF FOOD ADULTERATION.

The principal processes of food adulteration may be classified as follows:—(1) Adulteration secured by the elimination of some valuable constituent. The most common form of this adulteration, perhaps, is the sale of skim-milk or partially-creamed milk as the genuine article. It is well known that in milking a cow the portions of the milk secured at the last are richer in fat than those secured at the beginning. Hence a cow may be partially milked and the product sold as whole milk, while the residue remaining in the udder may be subsequently extracted and masquerade as cream. Thus the very method of milking may become a means of adulteration. (2) The addition of some harmless diluent. Dairy products furnish another example of this practice, illustrated in the hoary joke of the well and the milk pail. (3) Adulteration by the subsitution of a cheaper for a dearer product. This form of adulteration is illustrated in the preparation and sale of cotton-seed oil as olive oil, of oleomargarine as butter, or of horseflesh as beef. (4) Adulteration by colouring an inferior product to resemble a superior. This is a very common form of adulteration. It is shown in the colouring of green vegetables by copper salts, as, for instance, the French peas, which are very much liked and so commonly eaten; or in the colouring of butter, giving the butter of inferior quality the tint of a superior article; or in the colouring of oleomargarine so as to resemble butter; and the colouring of preserved meats to match the natural tints. (5) Food adulteration by the addition of antiseptics. This is probably the most common of all forms of adulteration, and all perishable articles of food have become illustrations to a greater or less degree of this class.

In considering the problem relative to the influence of adulterated food products on health, it is necessary to realise the practical impossibility of defining in absolute terms the extent of the injury which may result in any given case. Food is the fundamental factor in individual and national advancement. It may be said, *cæteris paribus*, that that individual or nation is the strongest and best which is the best fed. Therefore the study of the effect of food upon the health lies at the very basis of social and economic progress. It is well to safeguard the education of children and of youth; it is important that the religious and moral influences that surround them should be carefully considered; but before this comes the necessity of nourishment. Long before the infant knows good from evil, or noun from verb, it realises the necessity of sustenance. Mistakes which are made at the beginning are difficult of correction, and therefore the character of the foods of infants and children is a problem of the first importance.

Unfortunately, or fortunately, fashionable civilised life has brought largely into discredit Nature's method of nourishing infants, and hence we have thrown upon the market a legion of so-called infants' foods, many of which are not exactly suited to the juvenile digestive functions. It may be stated with certainty that what would be considered a healthy and unadulterated food for an adult might with justice be considered an unwholesome and adulterated food for an infant.

There is, perhaps, no other subject to which the attention of the medical fraternity could be so profitably directed as to the careful study of the character of the infants' foods offered as a substitute for mothers' milk. Another point which should be taken into consideration here is that the injury produced by artificial or adulterated foods in the infant lasts probably through life, if life be continued to any length of time, or hastens the death of the child. On the other hand, the adult and healthy stomach may sustain without injury the exhibition of adulterated foods to a limited extent. Therefore it is evident that the age limit is an important factor in the study of this subject. It is plain, without argument, that infants' food should correspond as nearly as possible to the average healthy milk of the mother. Its chemical composition can be closely imitated in the artificial foods which, of course, in the case of infants should be the milk of the cow or other domesticated animal, modified to resemble, as nearly as possible, the mean composition of mothers' milk.

In the case of adulterated foods the questions which arise are extremely complicated. The healthy adult stomach can bear with impunity the exhibition of adulterants, at least for a time. It is hardly fair, however, to assume from this fact that such adulterants are harmless. Rather should we judge them from their accumulative effect—that is, the final effect which their continued use would produce. They must also be judged largely from the effect which they will have upon digestive systems disordered or weakened by disease or advancing years. In other words, the duty of the law and of the medical profession is to protect the weak and the helpless rather than the strong and independent. It is safe, therefore, to predicate this rule, viz., that that form of adulteration which by any final action upon a healthy organism or by any immediate action upon a weakened organism produces harmful effects should be prohibited. On the other hand, those forms of adulterants which are plainly indicated upon the label of the food, and therefore work no deception upon the purchaser, may be permitted, providing they do not, under the above circumstances, produce any injurious effects.

It may be well at this point to state in detail a few of the forms of adulterants which typify the above statement.

There are some forms of adulterants which are not injurious to health. In this connection may be mentioned the food product known as glucose. Glucose is a term applied to a mixture of sugars derived from starch by hydrolysis. The hydrolytic effects are produced usually by a mineral acid, as, for example, sulphuric or hydrochloric acid. Now it is perfectly evident that the hydrolysis of starch cannot produce an injurious substance except when conducted in an improper manner. In the natural process of digestion starch, which is one of the most important foods, is hydrolysed first by the saliva and finally by the secretions of the small intestine, particularly that of the pancreas. The final products are the same as those produced by artificial hydrolysis. In my opinion, therefore, well-made glucose is a whole-

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some and nutritious food. When mixed with honey it is both palatable and nutritious, and this mixture is one of the most common forms of honey adulteration. Such an adulteration is to be condemned in the most unmeasured terms, but not because of the unwholesomeness of the product. If, on the other hand, glucose be manufactured with sulphuric acid containing a trace of arsenic, severe poisoning cases may result, as in the case of the beer poisoning at Manchester.

The food fats of healthy animals, such as lard and tallow, cannot be regarded as unwholesome products either when consumed in connection with other portions of the carcase or as separate foods. These fats are universally employed in our kitchen, and there is no reason for believing that when they are combined to form a pure article, as oleomargarine, they possess any unwholesome properties. The fraudulent sale of oleomargarine as butter cannot be too severely condemned, but, as is the case with glucose, not on account of unwholesomeness. The same is true of the many vegetable oils, such as the oil of cotton-seed, sunflower oil, and peanut oil, which have been largely employed as salad dressings in the place of olive oil. The adulteration of olive oil with these bodies is most reprehensible, but, again, the objections thereto cannot rest on hygienic grounds. But we are principally interested in the present instance with that other form of adulterants, which directly or indirectly, sooner or later, produce injurious effects.

Among these may be reckoned a great many of the artificial colours, such as those of copper and zinc, for preserving the green colour of vegetable foods. Many coal-tar colours are used for similar purposes, especially with animal products. A large list of such colours might be mentioned for use with fresh and preserved meats and with dairy products. Formerly white butter was coloured yellow, to resemble the more desirable varieties, by the use of a vegetable substance called annatto. Lately this vegetable colour, which by most persons is considered harmless, has been almost entirely superseded by yellow coal-tar colours; in fact, it is difficult to obtain in the open market at the present day butter which has not been artificially coloured. These coal-tar colours, when taken in considerable quantities, produce serious disturbances of the digestive organs. In the minute quantities employed it is probable that these colours are harmless, but the burden of proof rests upon those who use them; the presumption of guilt lies upon them. It is easy to extract from the quantity of butter used by a hungry man at an ordinary meal a sufficient quantity of this colouring matter to dye a large tuft of white silk a beautiful saffron. This colouring matter is absolutely indigestible, and thus it is fair to assume that when it has been absorbed into the system it is eliminated slowly and with difficulty. The colouring of butter artificially is only an excuse for poor dairying, since if milk cows be properly fed they will produce, the year round, a rich yellow cream, giving a delicious butter of the most delicate natural tint. It is unfortunate that the public taste has been so educated, or perhaps better, vitiated, in the use of artificially-coloured butter, that the more delicate tint of the natural article is a bar to its sale.

Of sixty-seven different samples of antiseptics lately examined, thirty-three contained borax or boric acid; eight were sulphites of sodium, potassium, or calcium; five contained salicylic acid or its sodium salts; four benzoic acid or its sodium salts; one was a mixture of boric and salicylic acids; one, boric acid and ammonium fluoride; three, formaldehyde; two, pyroligneous acid; one, ammonium fluoride; and one, beta-naphthol.

From the above statement it will be seen that one-half of the antiseptics offered for sale consist of borax or boric acid.

The next most abundant class of antiseptics is composed of the sulphites. Sulphurous acid is a well-known preservative, and its efficiency in this direction when combined with a base is but little diminished. The sulphites as a rule are easily soluble, and these are readily mixed with moist or liquid food products. In the form of a fine powder sulphites are easily applied to smooth surfaces such as meats, and with very happy effects in preventing decay.

By far the most objectionable of the antiseptics contained in the sixty-seven samples referred to is salicylic acid. As a preservative substance salicylic acid probably is to be preferred to any other, if its effects upon digestion are not taken into account. It is cheap, white in a powder, or colourless in solution, almost tasteless, and extremely effective as a germicide. Its use, however, even in small quantities, is to be unqualifiedly condemned. It deranges digestion, interferes with assimilation, and exercises a generally deleterious effect upon the system.

There are many other preservatives, notably saccharin and nitrate of potassium. Of these saccharin is highly objectionable, while nitrate of potassium in condimental doses may be permitted. The use of fluorin as a preservative is somewhat dangerous, and fluorides should be rigorously excluded, at least until it is demonstrated that they are harmless. The preservatives above referred to are often sold under trade names which give no clear idea of their composition. The sale of injurious substances under such fanciful names is a crime against the community, and those who engage in it ought to be adequately punished.

MILK-BORNE EPIDEMICS OF SCARLET FEVER.

Reporting on a recent outbreak of scarlet fever, in part due to an infected milk supply, Dr. George Newman, Medical Officer of Health for the district of Finsbury, refers to an objection to which his attention was called by various milk dealers:—

"The objection may be stated thus: If this milk was infected with scarlet fever, how is it that *all* the persons who purchased any of it have not contracted scarlet fever?" To this, he states, "my reply is as follows: First, the entire quantity of infected milk introduced into Finsbury was small, probably not in any case more than two milk-churns. Secondly, only a very small portion of the whole would be consumed *uncooked*. In many homes, it is satisfactory to report, milk for the children is regularly boiled. In many more instances milk is consumed not as a beverage but in milk puddings, &c. Thirdly, in order that infected milk may convey disease it must be consumed by susceptible persons. It is a well-proved fact that not all the persons coming in the way of infection contract disease. Ninety-nine insusceptible persons may come into the way of infection, one susceptible person may contract the disease."

The following suggestions regarding the control of milk supplies are also appended:—

"At present it may be said that whilst we have in operation registration of milkshops and some control over their management, there is little or no protection of the milk itself. A person buys some milk at his doorstep which comes from a small milkshop, which is supplied by a contractor, who is supplied by a large number of farmers in remote districts of the country, the purchaser, the purveyor, and the contractor all being entirely ignorant of the fact that this particular milk is derived from a farm on which an infectious disease is prevalent. I am strongly of opinion such a contractor should, in the first place, keep a register of the destination of the milkshops to which the milk from every farm with which he deals is delivered; and, in the

second place, he should only deal with farmers willing to furnish him with a written guarantee that they will inform him immediately of any outbreak of disease in man or animal upon their farms. By these two comparatively simple measures it would be possible to *trace* infection and *stop* infection at once instead of being compelled to wait until all the mischief has been done. I am, of course, aware of the protection afforded by Section 15 of the Dairies, Cowsheds, and Milkshops Order, but this does not concern the contractor.

"The custom of some purveyors of milk to obtain their daily supply from several sources is not in my judgment a desirable custom. It greatly complicates the difficulty of tracing the source of infection, as it also increases the liability of the purveyor to risk. Another circumstance which is apt to obscure the source in these cases is that the various supplies are delivered at different times and mixed together in the milkshop. Hence one delivery to purchasers may be a mixture of milk from various farms.

"The evidence obtained at this outbreak also draws fresh attention to the extreme importance of cleanly methods of purveying milk. Milk must be kept in clean vessels, which are regularly and thoroughly cleansed, and it must be protected as much as possible from dust, flies, &c. The simplest measures, if properly carried out, may be efficient and adequate."

COOKERY DE LUXE.*

This fine volume of close upon 800 pages deserves to enjoy a large circulation, for not only is it thoroughly practical, but it is conceived on sound scientific principles. Not the least valuable portion of the book is that devoted to theory and the elaboration of the general laws underlying the practice of cookery. While Mr. Senn is an enthusiast in his profession, he acknowledges that the art side must be subordinated to the scientific, and consequently he eschews the extravagantly ornamental, all over-elaboration, recognising that the aim of the cook must be to aid digestion, to facilitate assimilation. "The New Century Cookery Book" is, therefore, eminently a treatise of dietetics, a guide as safe for the plain household as for the artistic side of kitchen work. Commencing with a sensible *exposé* of the progress, aims, and objects of cookery, the author discourses of food elements and their combination, which naturally leads to notes on marketing, with most useful hints as to the choice of economical and wholesome foods. The question of fuels, the useful degrees of heat, and the chemical and mechanical changes which take place during the process of cookery are next discussed, forming an introduction to the chapter on the different processes of roasting, boiling, stewing, &c. The chapters dealing with kitchen construction and fittings will meet with the approval of all who are interested in sanitation. Coming to the practice of cookery, we note a philosophical chapter on the use of seasonings and flavourings. The chapter on soups will be found most serviceable in the kitchens of infirmaries and large public institutions, for though Mr. Senn discourses lovingly on the choicer descriptions of consommés creams, and purées, he does not neglect the cheaper forms and those required in sick rooms. There are seventeen chapters devoted to short treatises on, followed by a marvellous array of recipes for, hors d'œuvres, soups, sauces, garnishes, fish, entrées, roasts, removes, vegetables, salads, fruits, sweets, &c. A very full index and a number of good illustrations help to make this book not only an exhaustive but a practical encyclopædia of all that relates to food and its preparation for civilised man.

* "The New Century Cookery Book: Practical Gastronomy and *Recherché* Cookery." By C. Herman Senn. London: Spottiswoode and Co. Price 12s. 6d.

FOOD VALUES IN PRACTICAL LIFE.

A recent work on dietetics, by Dr. Hutchinson, has emphasised some of the facts of food values in an excellent way. The cherished notion that fish is a food for the brain worker has been consigned to oblivion, though many fish are cheap foods. Oysters are favoured among fish foods for the convalescent, but twelve oysters have not the nutriment of one egg. So, too, is the white of one egg equal in value to three teaspoonfuls of most beef extracts. "It is pathetic," says the writer, "to see poor people in cases of illness paying a large price for so very small a return."

The question of vegetarianism may almost be said to be settled by modern dietetic science. The strict vegetarian, to obtain a living wage of tissue-formers, must almost fill his stomach to its utmost limit three times a day. It means a low standard of life, and weak resistance to disease. It is not without reason the more energetic races of the world have been meat eaters.

Alcohol in moderation is considered by this author to be a valuable aid in the running of the human machine. It is used up in the body; it is a food, and spares the combustion of fat. If, however it exceeds the quantity taken to act as a food, it acts as a poison, and the percentage of waste rises. Alluding to "three-bottle men," the author says: "One is tempted to think that the power of our tissue to oxidise alcohol has actually undergone a decline." The notion that "fusel oil" is the deleterious agent in poor whiskey is exploded, though a volatile oil is suspected. Dr. Hutchinson is a firm believer in bottled stout, and considers it the model soporific. "It is far better than opium," he says, "and produces more nearly natural sleep."

MILK SUPPLIES FROM TUBERCULOUS COWS.*

By Dr. E. G. Annis, Medical Officer of Health, Borough of Huddersfield.

The recent Order of the Local Government Board, which has added tubercular disease of the udder to the class of diseases of cattle included in the Dairies, Cowsheds, and Milkshops Order of 1885, has enabled us to take certain steps to check the distribution of milk from milch cattle with diseased udders, but at the same time more drastic powers are still needed, for the Order states that milk from such like affected cattle (*a*) shall not be mixed with other milk; (*b*) shall not be sold or used for human food; (*c*) shall not be sold or used for swine or other animals unless and until it has been boiled.

These prohibitions on the face of them appear satisfactory and sufficient, but it is in their practical application that the difficulty arises, for when a case of diseased udder is found out, the Medical Officer of Health visits the premises and informs the owner of these requirements. Sometimes a promise is obtained that such will be carried out; at other times no definite promise is given. Whether, however, the promise is made or not, the matter is entirely in the hands of the cowkeeper, because unless one is able to have an Inspector practically upon the premises day and night continuously to see the affected animal milked, and the milk effectually dealt with, one cannot be absolutely certain that the requirements of the Order are carried out, and, of course, it will be seen from this that the difficulty is very great. Unfortunately, some milch cattle with tubercular disease of the udder are in the habit of giving a large amount of milk, and this large quantity proves a source of great temptation to some cowkeepers.

* Annual Report, 1900.

The further measures needed appear to be somewhat on the lines in force in reference to other material found unfit for human food, whereby seizure of the animal giving such milk could be made, the animal killed under supervision, and the carcase properly dealt with; of course, should any error be found to have been made, full compensation to be allowed. As an illustration of the above difficulties, I might mention that the Veterinary Inspector, in the course of his regular and systematic inspection of the cattle, found and notified to me a case of tuberculosis of the udder in an animal belonging to a registered cowkeeper. A sample of the milk was obtained and submitted to bacteriological examination, when tubercle bacilli were found to be present in considerable amount. I visited the cowshed, and interviewed the owner of the animal, informing him of the requirements respecting the milk, and strongly advising that the animal should be slaughtered under supervision, and its carcase properly dealt with, and for that purpose that the owner should notify me of the place and time of such slaughter, so that I might be present to inspect the carcase. This he promised faithfully to do. In the course of a week or ten days I heard from another source that the animal had been taken to a neighbouring market and sold to another milkman without any disclosure as to its condition being made, accordingly the distribution of this poisonous milk would still go on without let or hindrance, at any rate for a time, in some other place.

HOW COOKING POWDERS ARE "COOKED."

Some revelations made in a recent report by Dr. Alfred Hill, Birmingham City Analyst, in regard to the adulteration of baking powder, egg powder, and custard powder are worthy of note. The report states :—

BAKING POWDER.

Of nineteen samples six contained alum, and the vendors were prosecuted for the sale of an article injurious to health. For a number of years baking powder was regarded as food, and convictions were obtained for the sale of adulterated articles. In 1894 the Judges of the Court of Queen's Bench decided in the appeal case, James *v.* Jones, that baking powder was not an article of food in the meaning of the Sale of Food and Drugs Acts, and so prevented any further samples being taken. The Act passed last year extended the definition of "food," so as to include "any article which ordinarily enters into or is used in the composition or preparation of human food," and, therefore, baking powder is again legally a "food." The necessity of this action is shown by the large proportion of the samples containing the very objectionable ingredient alum.

The thirteen samples free from alum had been prepared from bicarbonate of soda, tartaric acid, and rice flour. Some of them had not been kept perfectly dry, and contained tartrate of soda produced by the reaction of the first two ingredients. A baking powder should consist of harmless materials, which, on the addition of water, will evolve carbonic acid gas, with sufficient starchy material to prevent premature decomposition. The efficiency of a baking powder will be proportionate to the amount of this gas produced by adding water to it. In these powders this varied from 1 to 9 per cent., while the rice flour varied from 52 to 81 per cent. The tartaric acid and the bicarbonate of soda should be present in the proportion of one of the former to 1·12 of the latter. In these samples the proportions varied from practically equal weights, to one part of tartaric acid to twelve of sodium bicarbonate, the latter being nearly all bicarbonate of soda. The raising power of the five samples containing over 80 per cent. of rice flour would be very slight, and their sale is very nearly, if not quite, a fraud on the public, but unfortunately there is no standard of composition, and I did not feel justified in certifying them as adulterated.

The other six samples were adulterated with alum, and contained from 13 to 35 per cent. of this objectionable ingredient. Five of them did not yield more than 4 per cent. of carbonic acid gas, so that besides containing alum they were deficient in raising power.

One sample was marked "Prize Medal Baking Powder," and another actually claimed to make bread more digestible, in spite of the presence of 25 per cent. of alum. It bore the following impudent label :—"By the use of this preparation, as the saccharine properties of the flour, which are destroyed by fermentation with yeast, are preserved, the bread is more nutritive, and a larger quantity is obtained from the same weight of flour. Bread made with yeast, if eaten before it becomes stale, ferments again in the stomach—producing indigestion and numerous other complaints; when made with this powder it is free from all such injurious effects. The powder is equally valuable in making puddings and pastry, which it deprives of all their indigestible properties."

EGG POWDER.

Fifteen samples of egg powder were taken, and all were free from alum. An unprejudiced person would expect that a preparation known as egg powder was either prepared from eggs or that it was of a similar composition to and a suitable substitute for them. This opinion would be supported by such labels as the following :—"Egg powder is a first-class substitute for eggs." One made the following claims :—"Concentrated egg power. A complete substitute for, but not made from eggs. This valuable preparation is a complete substitute for eggs in the making of all sorts of cakes, &c., to which it imparts the lightness, richness, appearance, and flavour of new-laid eggs."

Eggs are chiefly used in cookery for two purposes, to produce richness and lightness. The richness is due to the fact that an egg contains rather more than 100 grains of nitrogenous food, such as albumen, &c., and a similar quantity of fat. The glairy albumen of the egg when beaten up encloses a considerable quantity of air, and the gradual escape of this air during cooking produces lightness.

These samples of egg powder were practically nothing but baking powder coloured with turmeric or a coal-tar dye. Several of them had very little raising power, yielding less than 1 per cent. of carbonic acid gas on wetting. The "richness" imparted by them is confined to the small amounts of nitrogenous matter and fat contained in the rice or maize flour of which they are composed, though the colouring matter present might produce the appearance of richness. In short, these powders may impart lightness, but the "richness" will be less than that of an equal weight of ordinary flour. The labels quoted were distinct, if not fraudulent misrepresentations, but the absence of a standard prevents an analyst classing them as adulterated. Two samples bore fairly honest labels as follows :—"Egg powder. Not made from eggs. This valuable preparation may be used with great advantage in the making of all sorts of cakes, &c., to which it imparts all the lightness of eggs."

CUSTARD POWDER.

All the samples of custard powder, six in number, were free from alum. They were composed of maize or arrowroot with a small quantity of mineral matter, and coloured with turmeric or a coal-tar dye. Custards are prepared with eggs and milk, and form a nutritious article of diet, particularly for invalids. "Custards"

made with these powders would be no more nutritious than milk thickened with arrowroot or cornflour, and the difference in nutritive power might be serious in cases of illness. Again, large claims are made on the labels. One is marked:—"Custard powder makes the richest custards without eggs at half the cost and trouble." The label of another had the following observation:—"Custards made with this powder are considered by the medical profession to be more nutritious and lighter of digestion than any kind of meat, and are being strongly recommended by the most eminent medical men as a beneficial food for supper, and for invalids there is nothing to equal them."

If these samples had been certified as adulterated, the "custom of the trade" would be largely brought up to prove that custard powders always were so prepared, and a conviction would be impossible, but one strongly feels that deceptive labels such as the preceding should be prohibited.

TUBERCLE BACILLI IN BUTTER AND MARGARINE.

Markl (*Wiener Klin. Woch.*, No 10, 1901) states that during the past five years many investigators have found virulent tubercle bacilli in market butter. The question is, what percentage of market butter contains bacilli, and what is the danger from eating butter? Investigators differ widely in different localities, so the author made experiments with the market butter of Vienna. He used the Obermueller method, injecting the centrifugated melted butter into the abdominal cavity of animals. In all he innoculated forty-five guinea pigs, and not one died of true tuberculosis or showed signs of the disease; one case proved to be pseudo-tuberculosis. Ten animals died of peritonitis, but none injected with margarine died from peritonitis. In the case of pseudo-tuberculosis he found a long acid bacillus taking Gram's stain, and which he considers the cause of pseudo-tuberculosis as well as Petri's and Hormann Morgenroth's bacilli.

BRITISH CONGRESS ON TUBERCULOSIS.

We hear that the arrangements for the above Congress are not only in a very forward state in this country, but that active measures are being taken abroad to secure a large number of Continental visitors. The German Committee will be presided over by his Serene Highness the Duke of Ratibor.

In Paris a French Committee has been formed under the presidency of Prof. Brouardel, with Dr. Thoinot as honorary secretary, assisted by Drs. Horny, Sersiron, and Dumarest. This commitee has sent out a special circular to members of the profession and others who are particularly interested in the question of tuberculosis.

Amongst those who have already inscribed themselves are the Prince d'Arenberg, Profs. Brouardel, Lannelongue, Proust, and Nocard, and Drs. Martin, Léon-Petit, Sahran, Letulle, and Hérard.

Prof. Julian Colleja, President of the next International Congress in Madrid, one of the Vice-presidents from Spain, is also exerting himself to promote the interests of the cause.

Profs. von Schrotter, Weichselbaum, and others, have likewise joined from Austria. Amongst the representatives from America will be Professors Osler and Janaway, while numerous adhesions have been received from Hungary, Italy, Belgium, Norway, and Sweden, Holland, Switzerland, Portugal, and Egypt.

CANADA AS A SOURCE OF FOOD SUPPLY.

The Canadian Minister of Agriculture, the Hon. Sydney Fisher, is at present paying a visit to this country. In conjunction with Professor Robertson, the Government expert, he is looking out for some pure-bred stock for introduction on to the great experimental farms of the Dominion. In the course of conversation with a representative of the *Daily News*, Mr. Fisher gave some noteworthy details anent the possibilities of Canada as a producer of food supplies, claiming that his country has now advanced to be one of the greatest food-producing regions of the world.

Mr. Fisher is of middle age, very quiet and unassuming in manner, but a typical man for the responsible position he holds. He entered the Dominion Parliament as a staunch Liberal in 1882, and since the accession of his party to power in 1896 has held his present post in the Government. His school and University life was in England; he is a graduate of Cambridge, and has himself been a successful farmer on a large scale for many years in Canada. His practical experience and his position as one of the temperance leaders in the Dominion have given him a firm place in the confidence and affection of the farming community.

So much are we in the habit in this country of regarding Canada as a cold, bleak country, rather too near to Klondyke to be quite comfortable, that it is difficult to realise that the southern border of Canada is as far south as the shores of the Mediterranean.

It is an ideal food-producing region, with abundant rainfall, hot summer, a dry, cold winter, and a soil with the garnered fertility of untold ages.

In five years its export to this country of dairy products, grain, fruit, and meat has grown from 7 per cent. to 16 per cent. of our total imports. At this rate, in another dozen years Canada alone could provide our whole food imports.

But as cultivation and civilisation spread their borders, many of the difficulties of the farmer increase. One of the most curious changes is the spread of the bacteria of decay. Six years ago the virgin fields of the great North-West were almost in the condition of Mars as depicted by Mr. H. G. Wells—void of microbes. In the hottest summer weather the dairy farmer could keep his milk sweet for a week. Now, with the most elaborate cleanliness, he is lucky if it will keep more than a couple of days, and the journey to the butter or cheese factory must be made at least twice as often. Weeds and insect pests also follow the plough, and every year more science and forethought and organisation are needed.

With pardonable pride Mr. Fisher told me some of the good things done by his department to help the sturdy farmer-folk of the Dominion. While here the Government makes believe to help the distressed agriculturist by doles, in Canada the State helps the farmer by training his intelligence, by showing him, in four great experimental farms under different climatic conditions, what can be done, and how to do it; by collecting information and organising transit in a way that no individual effort could emulate.

"Our principle is," said Mr. Fisher, "that it is the business of the Government to take first risks. Where an experiment must be made, the Government bears the cost of it, and all alike reap the benefit. To give a case in point. Fifteen years ago, in one district the farmers discovered the benefit of co-operative dairying. The thing was an obvious success, but it would have taken generations for the plan to spread across the thousands of miles of Canada. The Government took the matter in hand, established model co-operative dairies throughout the country, and now the farmers everywhere have taken up the system, and in fifteen years a change has

been accomplished which would otherwise have taken half a century."

Not only does the Canadian Government teach its farmers how to grow, but how to get to market. Whenever there is a probability of a paying trade, it guarantees the cost of cold storage cars for dairy produce sent to the coast.

It has succeeded at small expense in inducing numbers of great steamship companies to provide refrigerating plant for bringing produce to this country, and is now carrying on an experiment by which fruit will be brought over this year in cool-air chambers, like those just adopted for the Jamaican banana trade.

Agents in the ports in this country watch the unpacking and condition of every ship load of produce, and report to Canada. Self-registering thermometers under seal are placed in every ship before leaving Canada, and the diagrams showing the temperature of the cargo throughout the voyage are posted back to the Dominion authorities. The produce is watched to its destination, and every care is taken that the Canadian farmer shall not suffer in reputation through ill-handling in transit.

While doing all this for the farmer, the Government is careful that the reputation of Canada shall not suffer by any malpractices among its own people. The production of margarine, or of cheese artificially "filled" with foreign fats, is prohibited by law, and there are stringent regulations as to fair and honest packing and branding of all goods.

As I listened to this story of national power and organised effort expended in the production of wholesome food for the maintenance of life, I could not help mentally comparing it with the pouring out of blood and treasure nearer home for the purposes of destruction.

There is an old story how Jove, pitying a great king robbed of his subjects by plague, gave him a new and victorious army by turning ants into men. Even so does the Government of Canada raise legions of tiny warriors from the soil to help the farmer against his myriad enemies. Those birds and insects which make war on destructive pests are studied and commended to the farmer's protection; bacteria which promote plant life and help to conserve moisture in the soil are cultivated; boys and girls at school are trained to pick out from corn the grains which will be most reproductive as seed. A periodical circular telling all about science and markets is posted to fifty thousand farmers.

When I add that, by a curious survival from more leisurely days, the Canadian Minister of Agriculture deals with statistics, the census, copyrights, patents, trade marks, and a dozen other things, your readers will wonder how Mr. Fisher found time to talk to me at all.

CASES IN COURT.

[RECORDS of Police-court proceedings for insertion in the "Food and Health" Supplement should reach us not later than the 10th of the month. Generally speaking, they should be as brief as possible, but where any important point of law is involved a fairly full report is permissible.—ED. S. R.]

Heavy Fine for Milk Adulteration.

IN Glasgow Sheriff Court, William Anderson, Braehead Farm, East Kilbride, was fined £60, including £7 11s. 8d. of expenses, for having forwarded to Glasgow for human consumption four butts of sweet milk and two butts of skim milk which contained added water. In the case of the sweet milk, the adulteration was 10, 12, 14, and 16 per cent. respectively, and in the case of the skim milk 5 and 9 per cent. The destination of the milk was the Glasgow Co-operative Society. It was the accused's second offence.

Unsound Fish at Darlington.

AT Darlington Borough Police-court, Chas. Harris, fish dealer, Bondgate, Darlington, was charged under the Public Health Act with selling unsound fish in the Darlington open market on June 1st.

Inspector Atkinson and Sergeant Jameson gave evidence as to the exposure of 8½ lb. of fish for sale on defendant's stall, which they stated was unfit for human consumption, and which the Medical Officer and a magistrate had ordered to be destroyed. The police-officer stated that it had been offered for sale at 3d. per lb.

Defendant and his employé said the fish had been taken to the market in mistake, and was put on one side.

The BENCH imposed a fine of £5, remarking that the poorer classes must be protected.

Bad Meat at Finsbury.

AT Clerkenwell Police-court Wm. Kendall, butcher and sausage maker, of 93, Chapel-street, Finsbury, was summoned for depositing for sale on 28th May, at his premises, 92 lb. of beef and pork, 4 lb. of sausages, nine pigs' plucks, and five bullocks' livers, which were unsound and unfit for the food of man.

Mr. RICKETTS, solicitor, prosecuted on behalf of the Finsbury Borough Council, and Mr. TRAVERS HUMPHREYS defended.

Inspector Billing proved the seizure of the meat,

Has the Charm of being always Nice, and it is also an excellent Digestive.

A Free Sample.—A Voucher for a Dainty Small Hovis Loaf will be gladly sent on request. — The HOVIS COMPANY, Ltd., Macclesfield.

which was subsequently condemned by the magistrate at Clerkenwell Police-court.

Dr. Newman, Medical Officer of Health, said he inspected the meat on May 28th. It was decomposed and quite unfit for human consumption. He saw the defendant, who stated that he had eaten some of the meat cut from that which had been seized, and with the exception of the livers he was of opinion that it was perfectly good.

For the defence it was urged that owing to the hot weather the meat had turned. It was seized in the early morning of Whit Tuesday, and had been in the shop since the previous Saturday. The inspector's visit occurred before the stock in the shop had been overhauled. The defendant had been in business in Chapel-street for eighteen years, and had the reputation for selling good meat.

Mr. Bros inflicted a fine of £50 and £5 5s. costs.

Gregory's Powder.

Taylor's Drug Company (Limited), of Leeds and High Holborn, appeared, before Mr. Fordham, by Mr. Yardley Tilley, solicitor, to answer a summons taken out by the Islington Borough Council, charging them with selling at their Holloway branch Gregory's powder which did not contain the ingredients specified in the British Pharmacopœia.

Mr. Bramall prosecuted for the Council.

Dr. Teed said that the bulk of the powder consisted of hydrated carbonate of magnesia instead of pure magnesia.

Mr. Tilley, in pleading guilty, said that when it was discovered that a mistake had been made a letter was sent to all the branches of the firm requesting the managers to stop the sale of the powder, but the article at this particular shop appeared to have been overlooked.

Mr. Fordham: What is the date of the letter?

Mr. Tilley: The letter was written in 1899.

Mr. Fordham: This may be a drug which improves with keeping.

Mr. Tilley urged that the company had done all they could, but Mr. Fordham said it seemed to him to be a deliberate fraud on persons who bought Gregory's powder. In this case he was dealing with a large concern which as far back as 1899 discovered that they were using an improper Gregory powder and took ineffectual means to stop the sale. He fined the company £10, with £3 3s. costs. "The public must be protected," added the magistrate.

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